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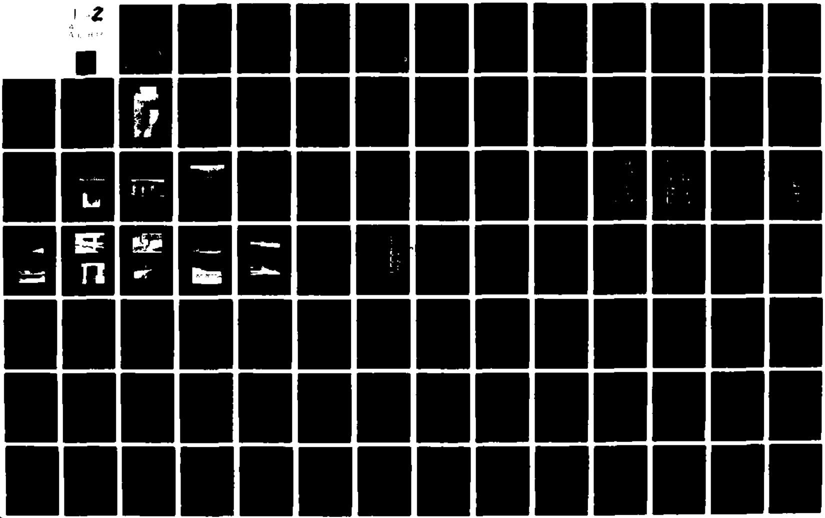

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MR 81-3

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Beach Changes at Atlantic City, New Jersey (1962-73)

by

Dennis P. McCann

MISCELLANEOUS REPORT NO. 81-3

MARCH 1981

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Beach Erosion Program	Shoreline changes
Beach nourishment	Shore structures

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Repetitive surveys of the above MSL beach were made along seven profile lines at Atlantic City, on the northeast end of Absecon Island, New Jersey, from 1962 to 1973. Major beach-fill projects were accomplished in 1963 and 1970 which introduced approximately 428,000 and 635,000 cubic meters of fill material, respectively, to the northernmost half of the study area; movements of this material are discussed. Seventeen storms were reasonably well

(continued)

documented during the study and their effects are reported. Measured storm changes were highly variable. For a given storm, adjacent profiles often indicated opposite changes, with one accreting and one eroding. This is attributed to structural effects, as well as wave refraction effects near Absecon Inlet. Storm changes of the MSL shoreline position were often opposite in sign from beach volume changes. Frequently, the shoreline change indicated accretion, while the beach volume actually suffered a net loss. The largest beach changes measured resulted from the storm of 23 September 1964, which eroded an average of about 23 cubic meters per meter of beach face above MSL, and the storms of 16 September 1967 and 25 February 1968, which caused an average shoreline recession of 5.9 meters. Beach changes were found to be seasonal, with the greatest volume of sand above MSL from May to October. The data collected provide no information on the profile changes occurring below MSL.

PREFACE

This report is published to provide coastal engineers with a description of beach changes at Atlantic City, New Jersey. The 11-year study was designed to measure beach responses to storm events as well as seasonal variations, and was begun shortly after, and as a consequence of the devastating storm of 5 to 9 March 1962. The work was carried out under the coastal processes program of the U.S. Army Coastal Engineering Research Center (CERC).

The report was prepared by Dennis P. McCann with the assistance of A.E. DeWall, under the general supervision of C. Mason, former Chief of the Coastal Processes Branch, Research Division.

The U.S. Army Engineer District, Philadelphia, performed all survey work except for a period in 1963-64 when data collection was contracted to Mauzy, Morrow & Associates of Lakewood, New Jersey. All data analyses and interpretations were made at CERC with assistance by M. Fleming, T. Lawler, D. French, A.E. DeWall, and W.A. Birkemeier.

Special thanks are extended to the visual observers from the City Engineer's Office of Atlantic City: J. Dolan, R. Badger, C. Turner, and C. McDonnell. Thanks are also extended to C.H. Everts, C. Galvin, K. Jacobs, M.T. Czerniak, and A.E. DeWall for their substantial contributions to this report from previous work on this subject. The author acknowledges the helpful review comments from A.E. DeWall, W.A. Birkemeier, C. Galvin, R.M. Sorensen, and R.J. Hallermeier.

Comments on this publication are invited.

Approved for publication in accordance with Public Law 166, 79th Congress, approved 31 July 1945, as supplemented by Public Law 172, 88th Congress, approved 7 November 1963.

Ted E. Bishop

TED E. BISHOP
Colonel, Corps of Engineers
Commander and Director

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CONVERSION FACTORS, U.S. CUSTOMARY TO METRIC (SI) UNITS OF MEASUREMENT

U.S. customary units of measurement used in this report can be converted to metric (SI) units as follows:

Multiply	by	To obtain
inches	25.4	millimeters
	2.54	centimeters
square inches	6.452	square centimeters
cubic inches	16.39	cubic centimeters
feet	30.48	centimeters
	0.3048	meters
square feet	0.0929	square meters
cubic feet	0.0283	cubic meters
yards	0.9144	meters
square yards	0.836	square meters
cubic yards	0.7646	cubic meters
miles	1.6093	kilometers
square miles	259.0	hectares
knots	1.852	kilometers per hour
acres	0.4047	hectares
foot-pounds	1.3558	newton meters
millibars	1.0197×10^{-3}	kilograms per square centimeter
ounces	28.35	grams
pounds	453.6	grams
	0.4536	kilograms
ton, long	1.0160	metric tons
ton, short	0.9072	metric tons
degrees (angel)	0.01745	radians
Fahrenheit degrees	5/9	Celsius degrees or Kelvins

To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use formula: $C = (5/9)(F - 32)$.

To obtain Kelvin (K) readings, use formula: $K = (5/9)(F - 32) + 273.15$.

BEACH CHANGES AT ATLANTIC CITY, NEW JERSEY (1962-73)

by
Dennis P. McCann

I. INTRODUCTION

Beach changes observed during repetitive surveys at Atlantic City, New Jersey, conducted by or for the Corps of Engineers in a 11-year study of seven profile lines from October 1962 to May 1973, are analyzed as part of the U.S. Army Coastal Engineering Research Center (CERC) Beach Evaluation Program (BEP) (formerly known as the Pilot Program for Improving Coastal Storm Warnings or Storm Warning Program). The BEP's objective is to measure beach and dune changes due to erosion and accretion at selected localities and relate these changes to the coastal processes producing them. The BEP was a direct outcome of investigations into the effects of the Great East Coast Storm of 1962 (see U.S. Congress, 1962).

Although this report meets the objective of the BEP, the program encountered many difficulties, including relatively few documented storms in the study area from 1962 to 1973 (the duration of the study), the difficulty in obtaining surveys immediately before and after the storms which did occur, and the difficulty and expense of obtaining continuous wave data. However, numerous data were collected of related wave, tide, and beach conditions, thus providing a substantial base for a long-term study of beach response having useful engineering applications.

This report presents both quantitative and qualitative analyses of beach profile changes and supporting data obtained at Atlantic City, and describes the survey procedures used and accuracy obtained. The three categories of beach profile changes analyzed are: (a) short-term changes, including storm-induced changes and other changes between surveys; (b) long-term changes, including seasonal and yearly changes; and (c) artificial effects, which include the effects of manmade structures such as groins and jetties as well as beach fill placed during the study period. The mean sea level (MSL) shoreline position and the volumes of sand stored on the beach above the MSL datum are the two principal variables analyzed. Observed wave conditions and climatic conditions are used to explain apparent trends in beach changes.

II. STUDY AREA

1. Location.

Atlantic City is located on Absecon Island, a barrier island off the Atlantic coast of southern New Jersey, 161 kilometers south of New York City (Fig. 1). The island is bounded on the south by Great Egg Harbor Inlet, and on the north by Absecon Inlet, and has a straight coastline oriented 64° east of north. Lakes Bay is the main body of water separating the island from the mainland.

Absecon Island is situated in an open section of coastline, partially sheltered by Long Island and Cape Cod from waves out of the north and northeast and by the Outer Banks of North Carolina from waves out of the south-southeast (Fig. 1). Bathymetry off the coast of Absecon Island is shown in

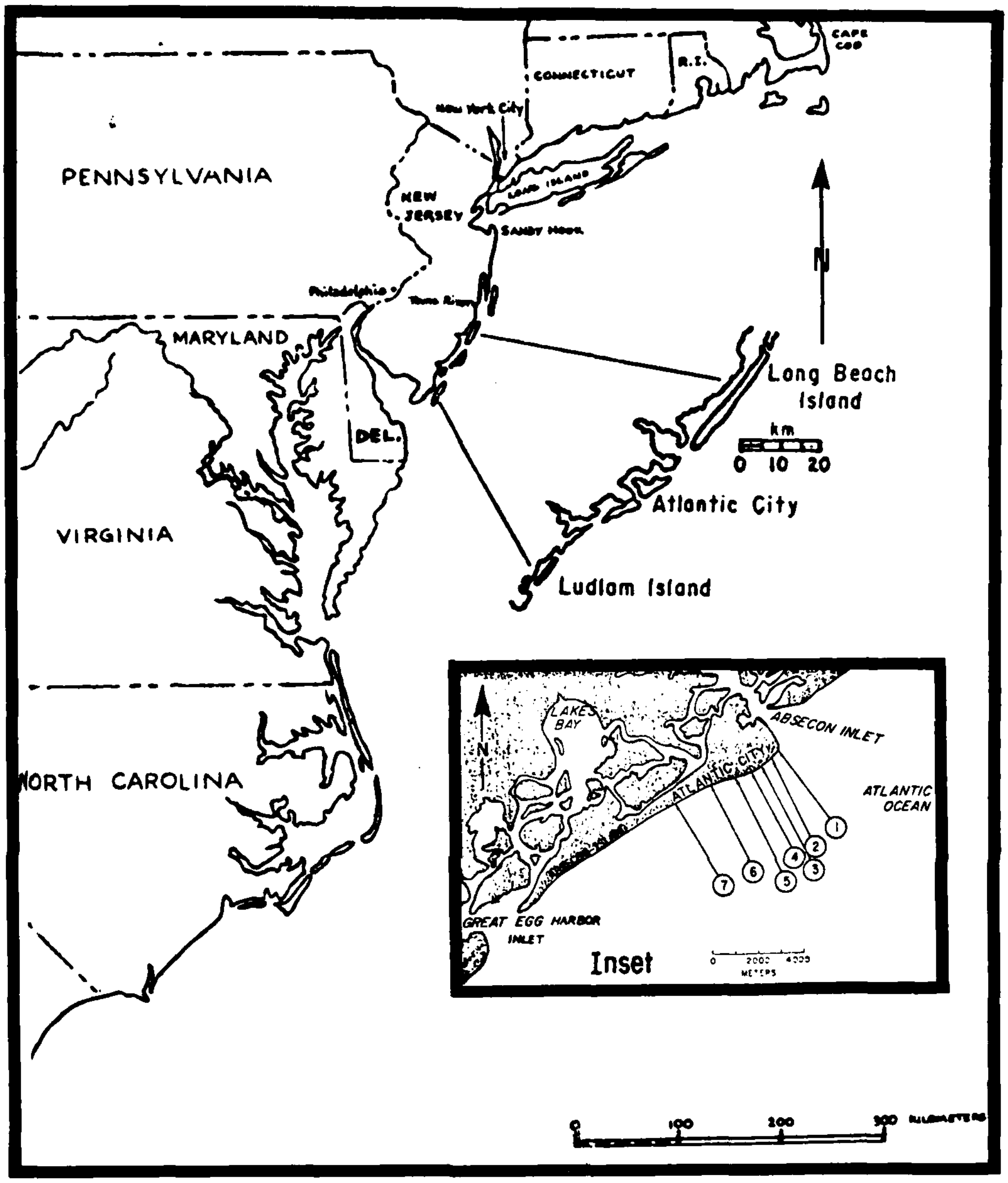

Figure 1. Study area showing profile line locations.

Figure 2. Most of the depth contours tend to be roughly shore-parallel, with linear shoals that trend toward the east off the central part of the island. The distance from the edge of the Continental Shelf, located at a depth of about 128 meters (420 feet), to the center of the island is approximately 125 kilometers.

2. Civil Works History.

Absecon Inlet is of great economic importance to Atlantic City as a result of its extensive use by recreational and commercial fishing fleets. During the early 1960's the inlet handled approximately 91,000 metric tons of waterborne commerce annually; however, this has recently tapered off to average

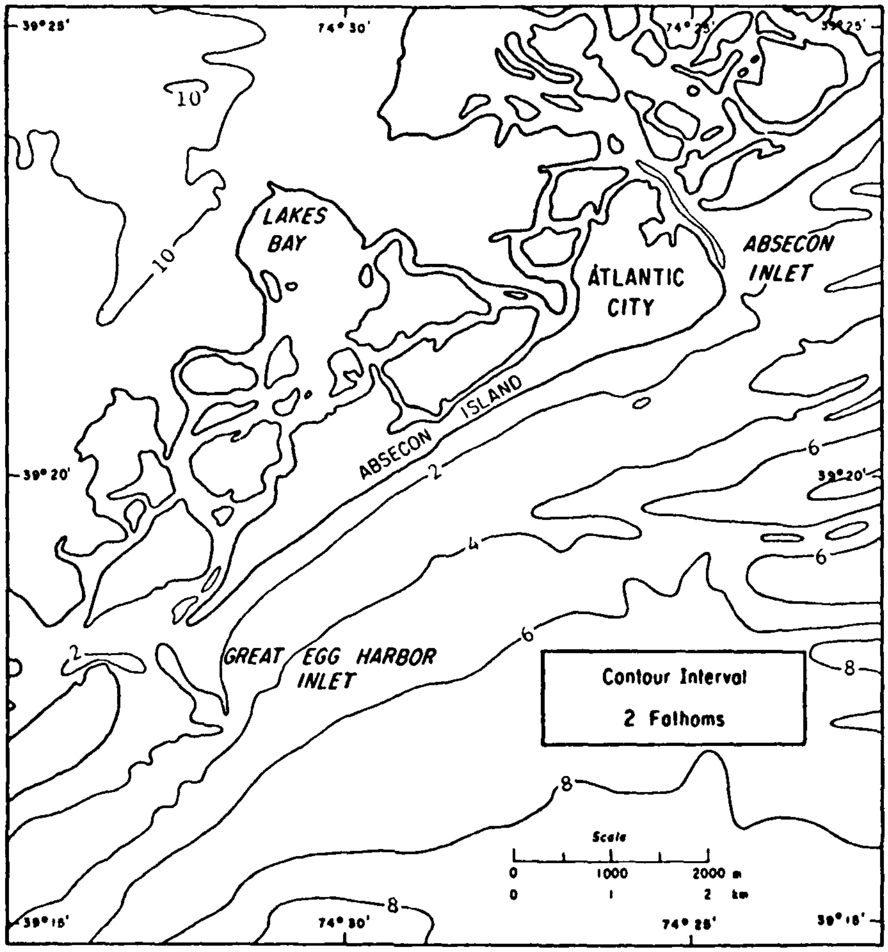

Figure 2. Bathymetry off Absecon Island.

less than 46,000 metric tons. Absecon Inlet has been maintained by the Federal Government since 1910.

Groin construction along the ocean frontage of Atlantic City, funded jointly by the City and State, began in 1928; 12 groins and 1 jetty were built between Absecon Inlet and Illinois Avenue. Eight of these groins and the jetty are still in existence, as shown in Figure 3 and in Table 1 which lists the coastal structures at Atlantic City. Other major structures (see Table 1 and Fig. 3) include the Boardwalk, which extends along the entire length of the ocean and inlet frontage, and five piers. Some of these structures are shown in Figure 4.

The only beach-fill project before 1962 consisted of about 816,000 cubic meters of material placed along the ocean frontage in 1948. However, an offshore sand-dumping test was conducted from 1935 to 1943 in which 2.7 million cubic meters was dumped into 5 to 6 meters of water southwest of Steel Pier which resulted in no measurable benefit to the shoreline (Yasso and Hartman, 1975). Approximately 428,000 cubic meters of sand was placed between Oriental and Virginia Avenues between February and May 1963. During the summer of 1970, approximately 635,000 cubic meters of fill was dumped along the beaches

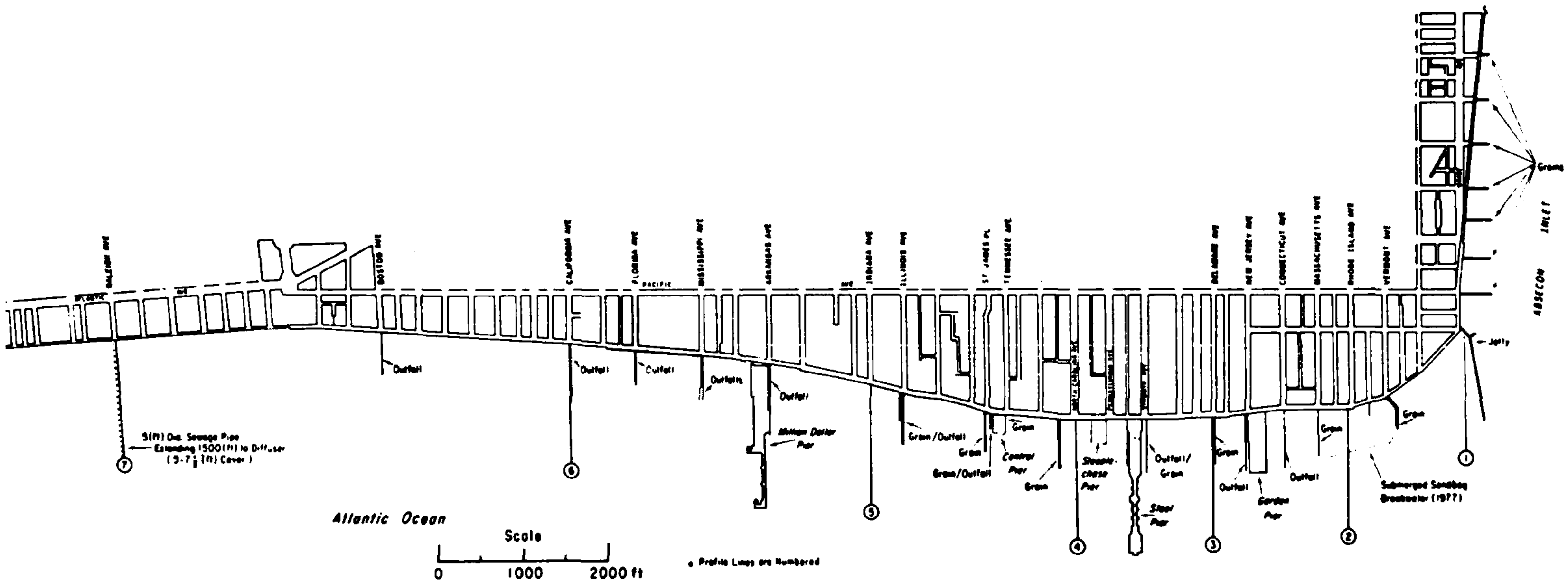

Figure 3. Structures along Absecon Inlet and Atlantic City ocean front.

Table 1. Structures along Absecon Inlet and the coast off Atlantic City[1].

Location	Construction type	Top elevation (MLW) inner (m)	Top elevation (MLW) outer (m)	Top width (m)	Length (m)	Year built	Condition 1972
N. side of Absecon Inlet	Stone jetty	2.44	2.44	4.57	1,137.00	1952-66	Good
Between Caspian and Melrose Aves.	Timber bulkhead	----	----	0.76	588.00	1935	Good
Adriatic Ave.	Timber and stone groin	2.44	2.13	4.27	86.56	1932-58	Good
Drexel Ave.	Timber and stone groin	2.44	2.13	4.27	50.29	1930-46	Fair
Melrose Ave.	Timber and stone groin	2.44	2.13	4.27	81.38	1954	Good
Melrose Ave. to 91 m south	Stone revetment	----	----	----	----	----	----
Madison Ave.	Timber and stone groin	2.74	2.13	4.27	68.58	1954	Good
Between Madison and Euclid Aves.	Timber bulkhead groin	----	----	0.61	457.20	1935-61	Good
Grammercy Ave.	Timber and stone groin	2.74	2.13	4.27	79.25	1954	Good
Between Grammercy and Atlantic Aves.	Stone groin	3.05	2.13	4.27	102.41	1946-56	Good
Between Atlantic and Euclid Aves.	Stone groin	2.74	2.13	4.27	94.49	1946-58	Good
Pacific Ave.	Stone groin	2.44	2.13	4.27	102.41	1946-58	Good
Oriental Ave. (36.6 m N. of profile 1)	Stone jetty	3.35	2.13	4.27	358.75	1946-61	Good
Vermont Ave.	Stone groin	3.05	0.30	4.27	121.92	1930-61	Good
Massachusetts Ave.	Stone groin	3.05	2.13	4.57	167.64	1948	Good
Between Vermont and Massachusetts Aves.	Sandbag breakwater	Top is approx. 1.2 m below MLW					
Between Connecticut and Massachusetts Aves.	Timber bulkhead	----	----	----	----	1932	Poor
Connecticut Ave.	0.5-m outfall	----	----	----	----	----	----
Under N. edge of Garden Pier	Timber and stone groin	----	----	----	----	----	Poor
New Jersey Ave.	Garden Pier (0.76-m outfall)	----	----	----	----	----	----
Delaware Ave. (4.6 m N. of profile 3)	Timber groin	2.44	2.13	1.22	182.88	1950	Fair
Virginia Ave.	Timber and stone groin (0.76-m outfall)	2.44	2.13	1.22	167.64	1950	Good
Between Presbyterian and Virginia Aves.	Steel Pier (old timber groin beneath)	----	----	----	----	----	----
Between North Carolina and Pennsylvania Aves.	Steeplechase Pier (0.91-m outfall to S.)	----	----	----	----	----	----
Between North and South Carolina Aves.	Timber groin (60 m S. of profile 4)	2.44	2.13	1.22	182.88	1950	Good
Tennessee Ave. (N. of Central Pier)	Stone groin	2.44	2.13	4.27	43.59	1928	Poor
Between Tennessee Ave. and St. James Place	Central Pier-Timber groin (0.76-m outfall)	----	----	----	----	----	----
St. James Place	Timber groin	2.44	0.61	1.22	147.83	1950	Fair
Illinois Ave.	Timber and stone groin (0.91-m outfall)	2.44	0.61	1.22	182.88	1950	Poor
Arkansas Ave.	0.91-m outfall at N. edge of Million Dollar Pier	----	----	----	----	----	----
Mississippi Ave.	0.61-m double outfall	----	----	----	----	----	----
Florida Ave.	0.61-m outfall	----	----	----	----	----	----
California Ave.	0.91-m outfall	----	----	----	----	----	----
Boston Ave.	0.91-m outfall	----	----	----	----	----	----
Raleigh Ave.	1.5-m sewage pipe extending 457 m to diffuser	----	----	----	----	----	----

[1]Updated from U.S. Army Engineer District, Philadelphia (1974).

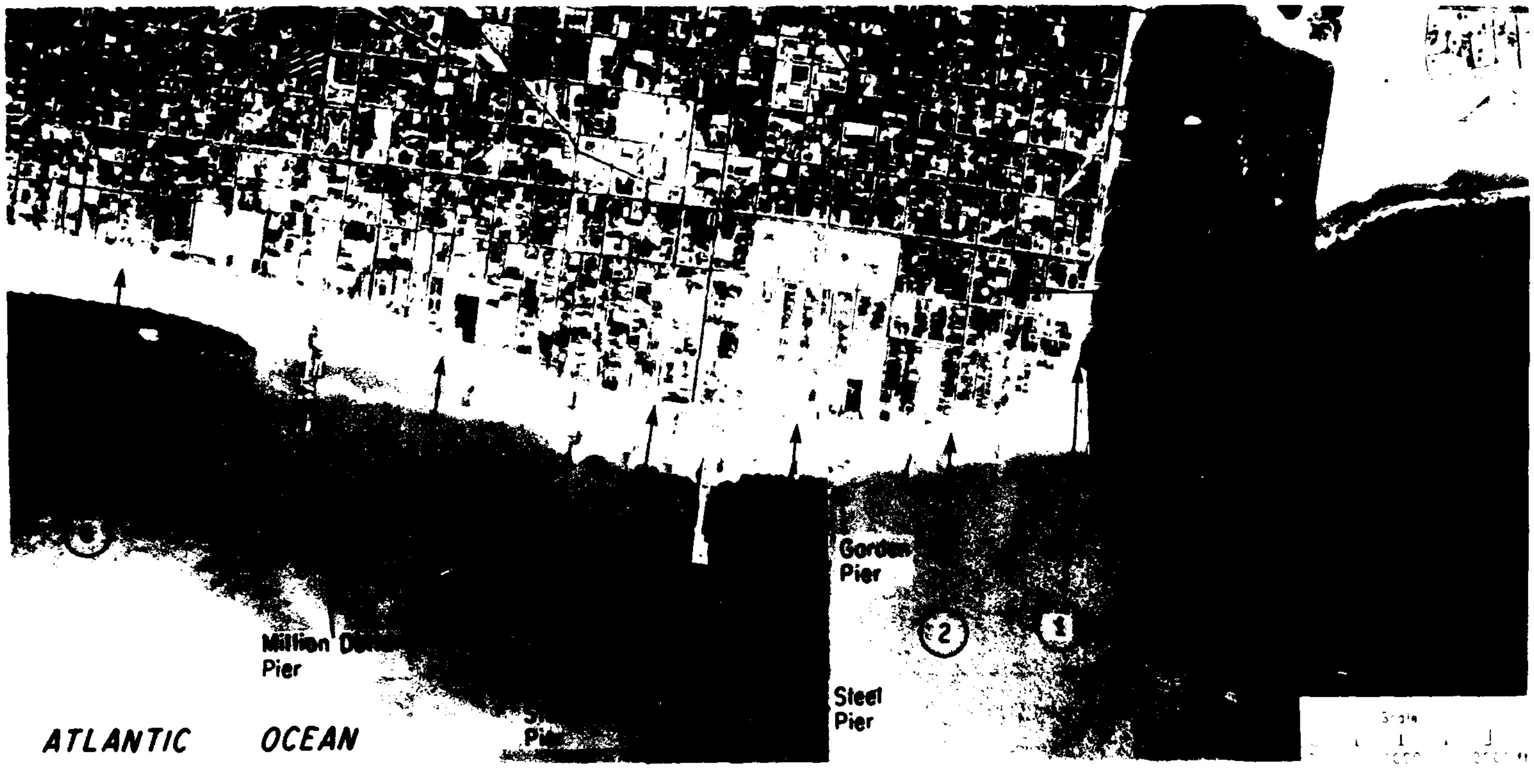

Figure 4. Aerial view of Absecon Inlet and Atlantic City (30 April 1973).

between Oriental and Illinois Avenues (Fig. 3). The source of this dredged material has been Absecon Inlet, just inside the Brigantine jetty (Fig. 4) (Everts, DeWall, and Czerniak, 1974).

A detailed discussion of civil works affecting the beaches on Absecon Island is presented by U.S. Army Engineer District, Philadelphia (1974).

3. Beach Material.

New Jersey beaches consist mainly of medium- to fine-grained sand, composed mostly of quartz. The Piedmont and Highlands of the Appalachian Province provide the ultimate source of the beach sands. Presently, due to the low terrain and gentle slopes of the Coastal Plain, the rivers draining the higher areas become sluggish and deposit much of their sediment load along the way before reaching the coast. What little sediment does reach the coast becomes trapped in the lagoons behind the barrier islands, and never reaches the beaches. The only natural sources of beach material now appear to be the ocean floor and the beaches themselves.

Ramsey and Galvin (1977) found the median grain size at Atlantic City to be 0.27 millimeter (1.9 phi), with a sample range of 0.22 to 0.33 millimeter, which agrees with the values obtained from surveys taken in 1936 and 1947 (Beach Erosion Board, 1950). They also determined that the grain size decreased from the north to the south, the direction of net littoral transport. This trend of decreasing grain size from north to south is shown in Figure 5 which indicates the southward decrease in grain size across three profiles at Atlantic City. A spatial trend in grain-size variation from the berm to mean low water (MLW) is also indicated in Figure 6 for the sample averages and in Figure 7 for the profile averages. These plots show an increase in grain size from the berm to MSL, and then a slight decrease from MSL to MLW. A seasonal grain-size variation shown in Figure 8 indicates that the grain size increases from about 0.25 millimeter in October to 0.30 millimeter in December while decreasing from about 0.30 millimeter in December to 0.26 millimeter in March. This trend suggests an increase in the slope of a stable foreshore from October to December when the sizes are increasing and a decrease in foreshore slope when the grain sizes are decreasing from December to March.

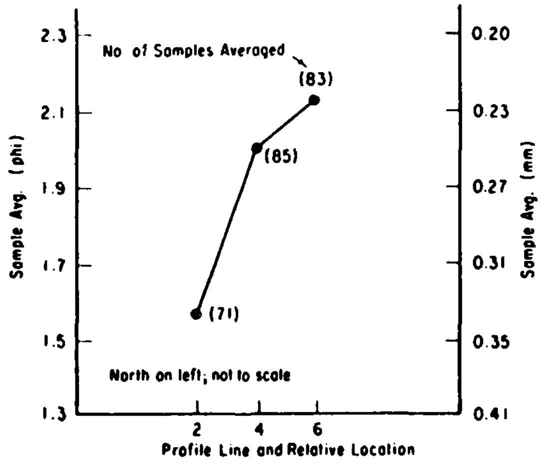

Figure 5. Southward decrease in median grain size at Atlantic City; sample averages are by profile line (from Ramsey and Galvin, 1977).

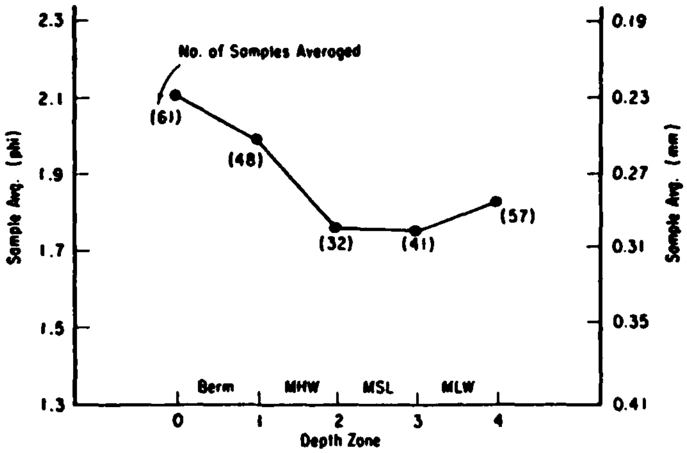

Figure 6. Median grain-size variation across profile at Atlantic City; data consisted of 238 samples collected between January 1968 and March 1969 (from Ramsey and Galvin, 1977).

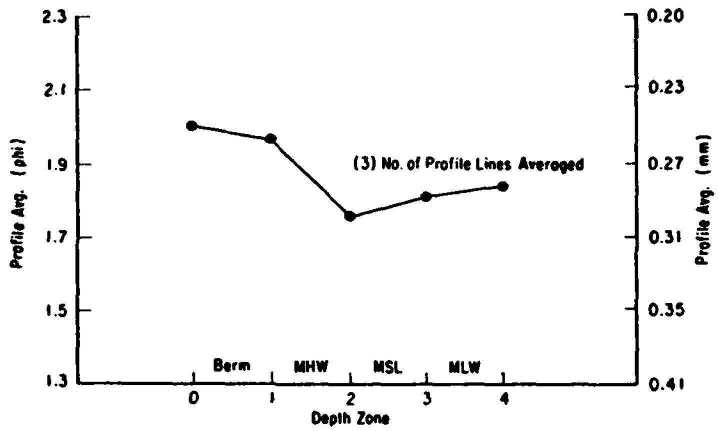

Figure 7. Median grain-size variation across profile at Atlantic City (from Ramsey and Galvin, 1977).

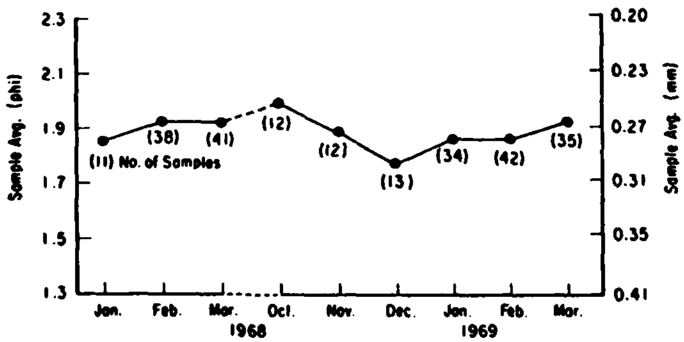

Figure 8. Monthly median grain-size variation at Atlantic City; samples were taken from the berm to below MSL (from Ramsey and Galvin, 1977).

The net littoral transport rate along Absecon Island is estimated to be 115,000 cubic meters annually in a southwesterly direction as determined from estimated gross northerly and southerly annual rates of 191,000 and 306,000 cubic meters, respectively (U.S. Army Engineer District, Philadelphia, 1974). Further evidence for southwest littoral transport is shown by Everts (1975) in the pattern of deposition that decreased the width of Great Egg Harbor Inlet (Fig. 1) 30 percent from 1949 to 1974. Everts also concludes that possibly 25 percent of the longshore transport could be accounted for by sand movement on bars.

Taking into consideration the previously mentioned lack of supply of beach material from natural sources along with the net littoral transport to the southwest, it is obvious that this imbalance of material leaving and entering the area results in erosion of the beaches. These circumstances, in turn, would require occasional beach nourishment to sustain the beach. Two such beach-fill projects were accomplished during the study period, as previously mentioned, with the fill material having a mean grain size of 0.3 millimeter (Everts, DeWall, and Czerniak, 1974). A buildup of sand occurred from 1877 to 1939 on the northern end of Absecon Island, which resulted in the Absecon Lighthouse being so far inland today.

4. Wind, Wave, and Tide Data.

Wind data shown in Figure 9 consist of hourly records obtained before the profile study period by the National Weather Service (NWS) from an anemometer atop the now abandoned Absecon Lighthouse (Fig. 4). Analysis of these data indicates that the predominant wind directions are from the south and west. The corresponding wind velocity from these directions is generally in the 22.5- to 45-kilometer-per-hour range (Fig. 9,b). This agrees with the resultant wind direction determined from data taken 16 kilometers inland at the Aviation Facilities Experimental Station from 1968-72 (Fig. 10). Figure 9,b also shows that most of the high-velocity winds (46.7+ kilometers per hour) were from the northeast. The *resultant* wind direction, as shown in Figure 10, is the magnitude of the vector sum of wind directions, and the average windspeed indicated is the sum of the recorded windspeeds divided by the number of observations.

Winds are from the west-northwest during the winter months of November to March. From March to July the winds shift to the south with a shift back to the west from July to September. After an abrupt shift back to due south in October, the winds return to the west-northwest direction of the winter (Fig. 10).

Data from the Summary of Synoptic and Meteorological Observations (SSMO) (U.S. Naval Weather Service Command, 1970) show the predominant wind directions offshore of Atlantic City throughout the year (Fig. 11). Monthly data indicate that the winter winds of November to March are from the west and northwest, whereas the spring and summer winds of April to August are from the south and southwest. These trends are in general agreement with those indicated above for winds measured inland, except that neither September nor October show directions nearly as predominant as the other months.

The bearing of a line normal to the Atlantic City beach at Steel Pier is approximately 26° east of south. Waves impinging from east of the normal

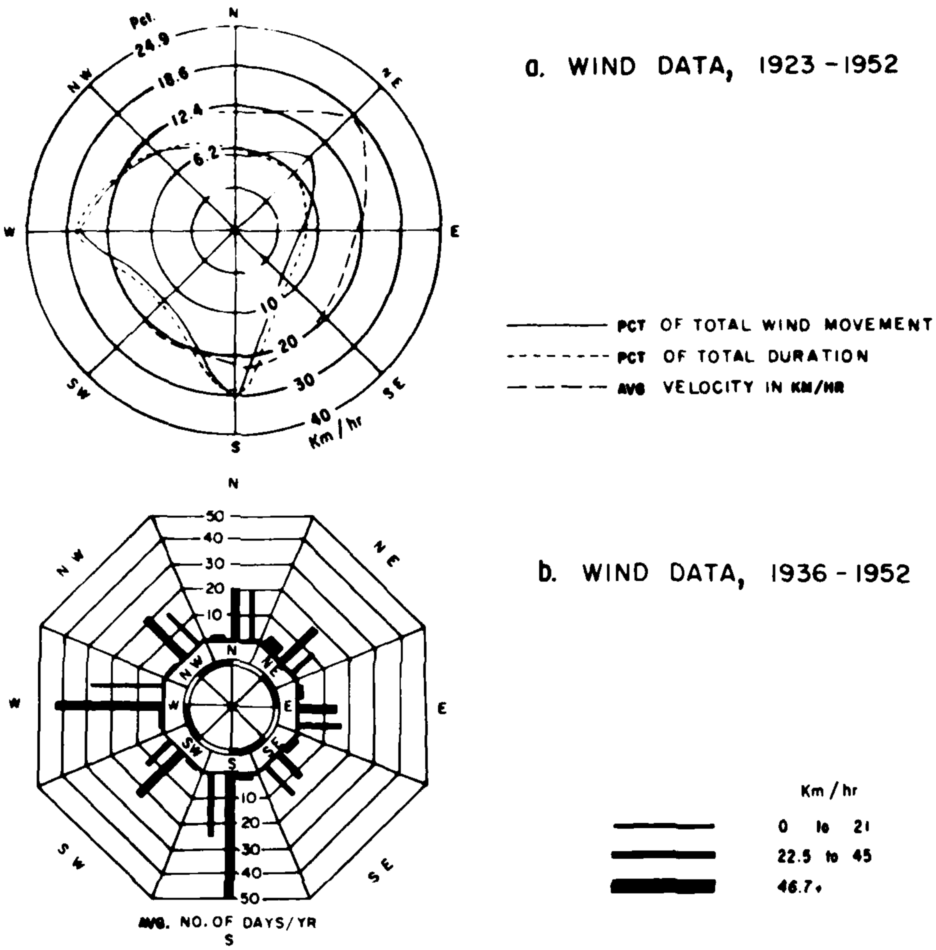

Figure 9. Wind data (yearly averages) for Atlantic City (from U.S. Army Engineer District, Philadelphia, 1974).

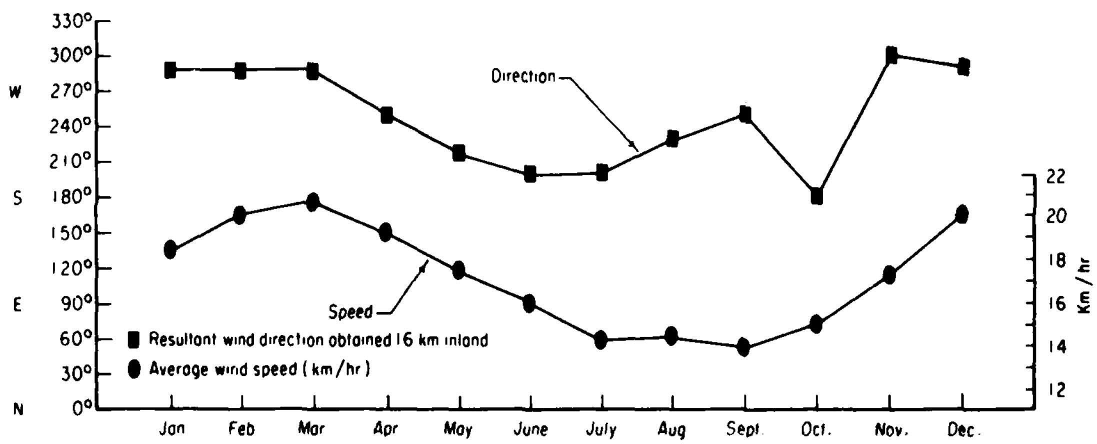

Figure 10. Mean monthly wind speed and direction at Atlantic City (1968-72).

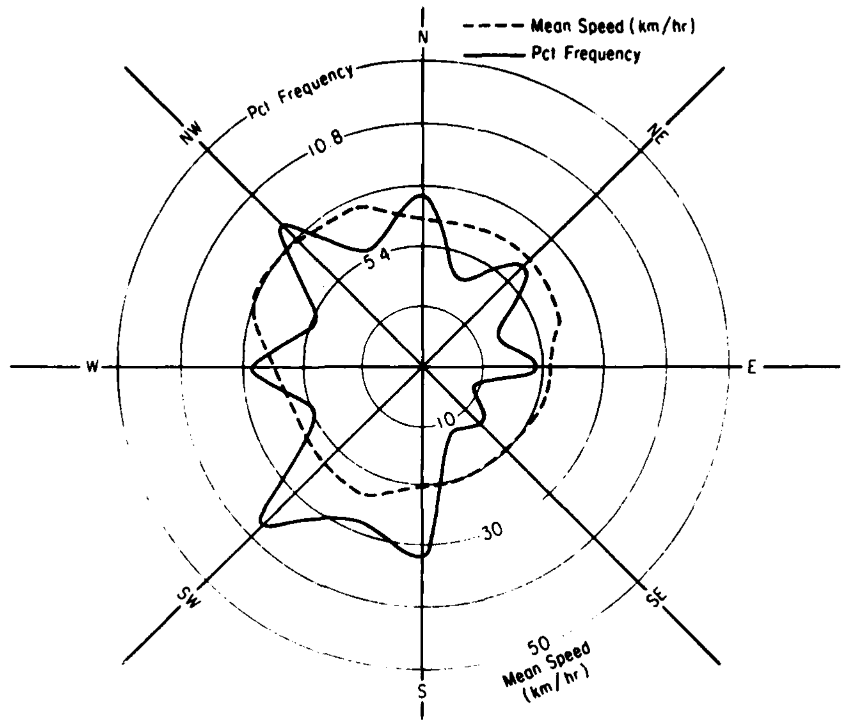

Figure 11. Annual wind distribution by percent frequency and mean speed for Atlantic City. Data obtained from SSMO (U.S. Naval Weather Service Command, 1970) collected during 1949-68 and covering the area from 38° to 40° N. latitude and 72° W. longitude to the coast.

result in a southwest, or "down-beach drift"; waves from west of the normal produce a northeast, or "up-beach drift." Results from visual wave observations obtained at different times at Atlantic City indicate that waves east of the normal occur greater than 50 percent of the time (Figs. 12 and 13). An earlier report by the U.S. Army Engineer District, Philadelphia (1938), also indicated a predominant down-beach drift occurring about 48 percent of the time compared to about 24 percent up-beach drift and 28 percent onshore-offshore drift.

CERC maintained a relay-type wave gage on the end of Steel Pier (5.2 meters mean water depth) from 1962 to 1969, which measured water surface elevations in 6-centimeter increments. These data, analyzed by Thompson (1977), indicate that during 1964 to 1967 the average significant wave height and average wave period increased substantially in September (Fig. 14). This is also in general agreement with Figure 4-10 in the Shore Protection Manual (SPM) (U.S. Army, Corps of Engineers, Coastal Engineering Research Center, 1977). The explanation for this behavior during this particular period is shown in Figures 15 and 16 which give the values by month for each of the years considered. The peak in values of period and height during September 1964 can be attributed to Hurricanes Dora, Ethel, and Gladys offshore along the Atlantic coast. Although none of these hurricanes directly hit New Jersey, they generated large waves which reached the shore. Historically, there is a substantial increase in tropical cyclones and hurricanes in the North Atlantic Ocean during September (Fig. 17); however, only a few

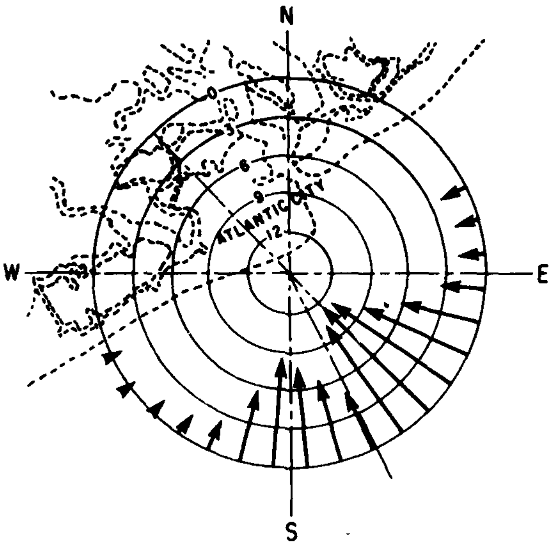

Figure 12. Wave approach at Steel Pier. Length of arrows indicates the percentage of wave approach from the various directions as determined by periodic observations at the end of Steel Pier during November 1935 to May 1937, and July 1947 to March 1948 (from Beach Erosion Board, 1950).

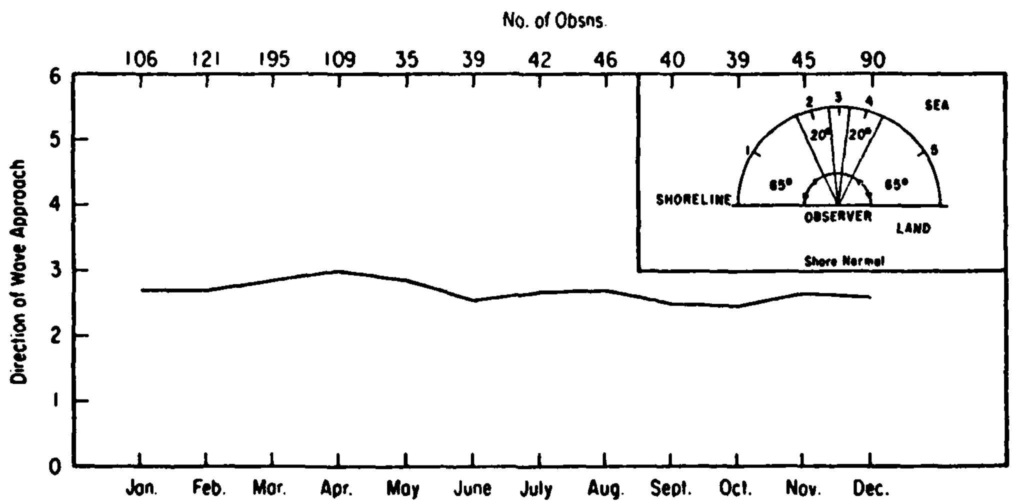

Figure 13. Mean wave direction by month for visual observations obtained from January 1968 to October 1974.

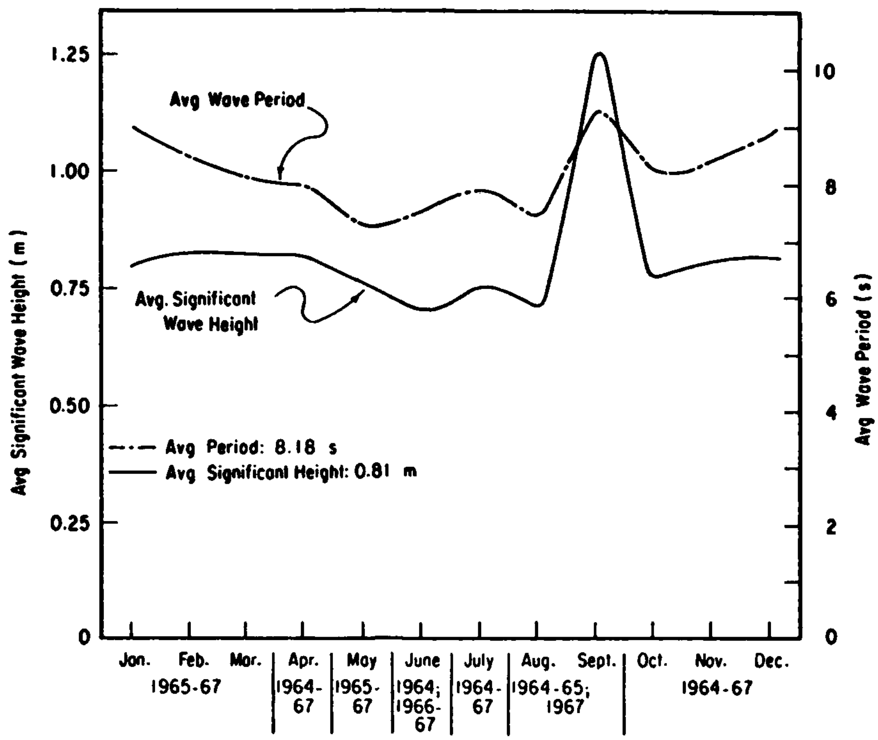

Figure 14. Average significant wave height and average wave period by month from April 1964 to December 1967.

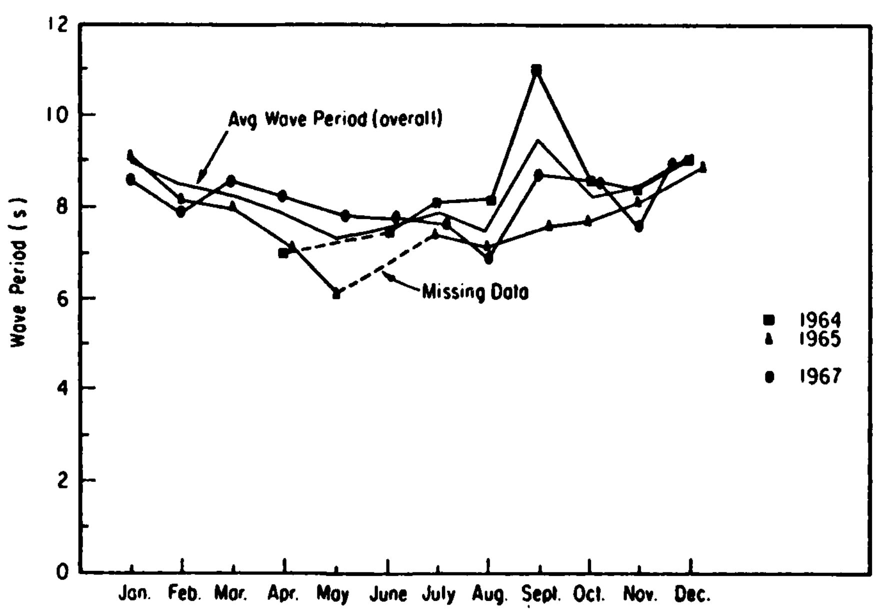

Figure 15. Means of wave periods for Atlantic City; determined from 7-minute pen-and-ink records taken six times daily during 1964, 1965, and 1967 (from Thompson. 1977).

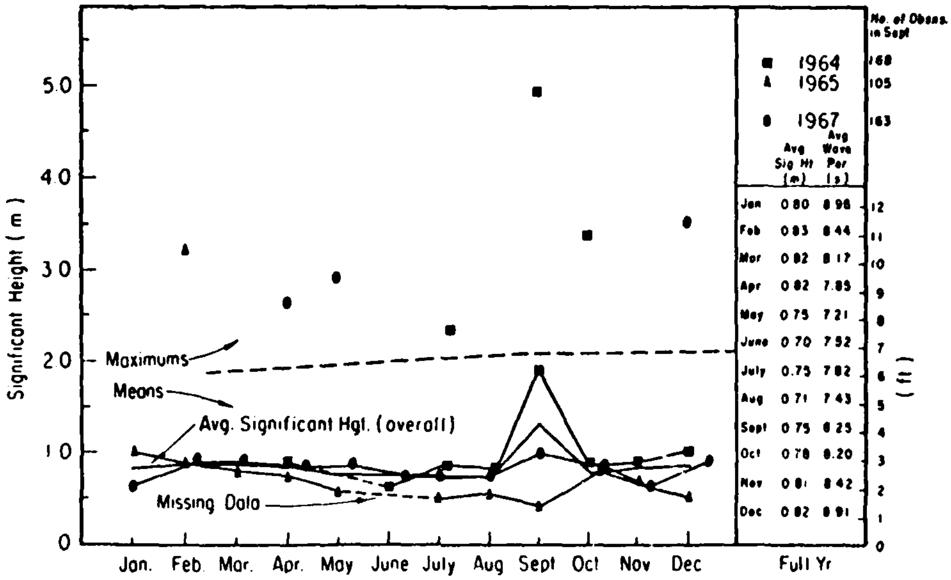

Figure 16. Maximums and means of significant wave height for Atlantic City; determined from 7-minute pen-and-ink records taken six times daily during 1964-65 and 1967. Values for September were obtained by determining the mean from the respective plot for height and period for 1965 and 1967, then weighted by the number of observations during 1964, 1965, and 1967 to arrive at an average for the years 1965 and 1967; all other average values include the monthly values for 1964, 1965, and 1967 (from Thompson, 1977).

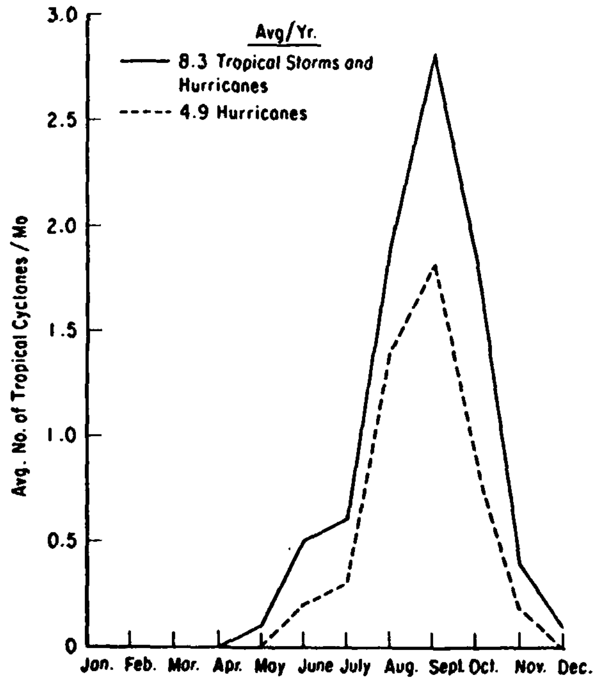

Figure 17. Average number of tropical cyclones occurring per month (1886-1977) in the North Atlantic Ocean (excluding depressions but including subtropical systems) (from National Weather Service, 1978).

hurricanes directly impact on Atlantic City (two "direct hits" from 1899-1977 were recorded by the National Weather Service, 1978). Most hurricanes remain offshore in this area, producing indirect effects such as increased wave heights. Extratropical storms, particularly northeasters, are second only to hurricanes in their destructive intensity causing considerable damage to the beaches and structures along the New Jersey coast. The resultant damage from these storms is largely due to the high winds, waves, and increased water levels they generate.

The astronomical tides at Atlantic City are semidiurnal and have been monitored almost continuously since 1912 from a primary tide station located on Steel Pier. The mean tidal range is 1.25 meters, with the normal tidal range varying from 0.98 meter for neap tides to 1.52 meters for spring tides. The highest recorded storm tide at Atlantic City, 2.32 meters above MSL (Table 2), occurred during a hurricane in September 1944. The March 1962 storm caused the second highest storm tide, 2.19 meters above MSL (Table 2). Additional information on extreme high tides and frequency of maximum monthly high tides is provided in Table 3 and Figure 18, respectively (U.S. Congress, 1964a).

The National Ocean Survey's (NOS) accepted mean tidal heights for this location, based on the timespan 1948 to 1966, referenced to the ocean MLW datum, are: mean high water (MHW), 1.25 meters; mean tide level, 0.62 meter; National Geodetic Vertical Datum (NGVD), 0.50 meter; and MSL, 0.63 meter. During the period 1912 to 1969, the apparent secular trend for the change in sea level at Atlantic City was a rise of 0.283 centimeter per year (Hicks, 1972). Approximately 0.1 centimeter per year of this change is due to the glacial-eustatic rise in sea level, with the remainder attributed to subsidence.

The seemingly minor, but never-ending changes in sea level (Fig. 19), spanning years and decades, are masked by the more dramatic changes due to the meteorological and oceanographic parameters affecting the yearly variability in sea level. These include variations in wind, currents, water temperature, salinity, river discharge, and direct atmospheric pressure (Hicks, 1972).

Table 4 provides a summary of physical characteristics relating to Atlantic City.

III. DATA COLLECTION AND ANALYSIS

1. Establishment of Profile Lines.

Seven profile lines were established along azimuths normal to the shoreline in 1962 (Fig. 1). The spacing between adjacent profile monuments generally increased from profile lines 1 to 7 with the smallest distance between profile lines 1 and 2 at 426 meters, and the greatest distance between profile lines 6 and 7 at 1.62 kilometers. Some of these monuments were, however, offset from the actual profile lines. Standard bronze Corps of Engineers' disks were placed on or near profile lines 1 to 4, and 6 in 1975, and profile lines 5 and 7 in 1976. Each monument was then referenced horizontally to the New Jersey Transverse Mercator and vertically to NGVD (sea level datum of

Table 2. Height of storm tides at Atlantic City.

Yr	Mo	Elevation to MSL (m)
1933	Jan.	1.71
1933	Aug.	1.52
1936	Sept.	1.43
1944	Sept.	2.32
1944	Nov.	1.77
1947	Nov.	1.80
1950	Nov.	2.13
1953	Oct.	1.86
1953	Nov.	1.52
1960	Sept.	1.86
1962	Mar.	2.19
1963	Nov.	1.46
1964	Feb.	1.43
1965	Jan.	1.19
1966	Jan.	1.83
1967	Feb.	1.53
1968	Nov.	1.92
1969	Nov.	1.37
1971	Aug.	2.13
1972	Dec.	1.71

Note—Data for 1933-62 from U.S. Congress (1964a); data for 1963-72 compiled by subtracting predicted tides from recorded tides (NOS) to determine highest for the year.

Table 3. Extreme high tides at Atlantic City (from U.S. Congress, 1964a).

3-yr period	Heights above MSL (m)															
	1.01	1.07	1.13	1.19	1.25	1.31	1.37	1.43	1.49	1.55	1.61	1.77	1.80	1.86	2.13	2.32
	No. of occurrences															
1936-38	205	126	77	44	25	15	7	3	1	--	--	--	--	--	--	--
1939-41	287	194	129	73	34	20	11	8	5	3	2	--	--	--	--	--
1942-44	326	213	143	89	43	28	16	10	8	4	3	2	1	1	1	1
1945-47	338	234	157	99	61	44	19	9	6	3	1	1	1	--	--	--
1948-50	290	189	126	82	46	37	21	11	5	2	2	1	1	1	1	--
1951-53	311	203	130	88	52	30	16	7	4	3	1	1	1	1	--	--
1954-56	344	233	150	98	55	38	19	13	6	1	--	--	--	--	--	--
1957-59	356	231	140	83	56	29	14	7	4	2	1	--	--	--	--	--
1960-61[1]	409	294	213	143	96	66	51	29	18	14	12	3	3	1	--	--

[1] Adjusted by fraction 3/2 to represent a 3-year period for purposes of comparison.

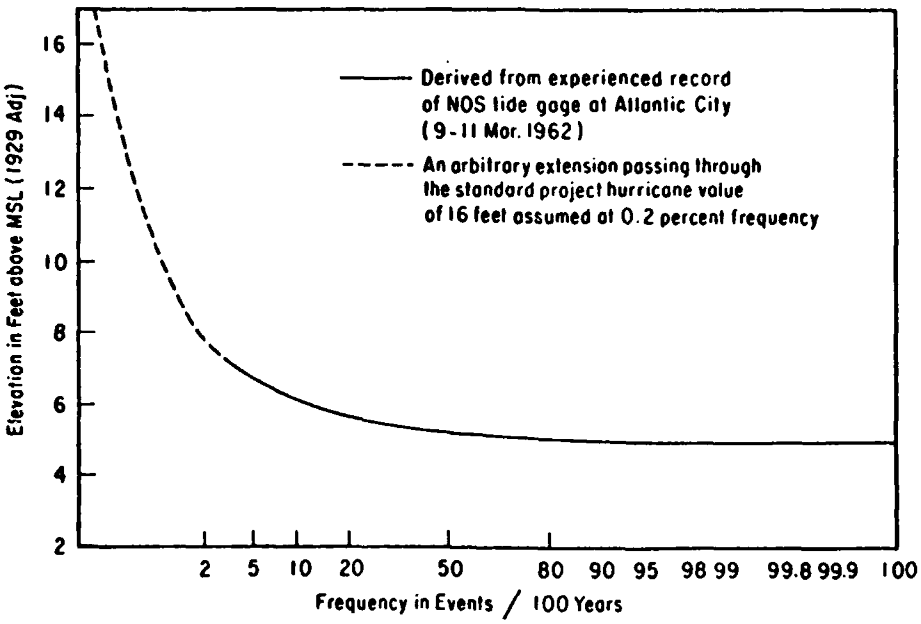

Figure 18. Frequency of maximum monthly high tides at Atlantic City (from U.S. Congress, 1964a).

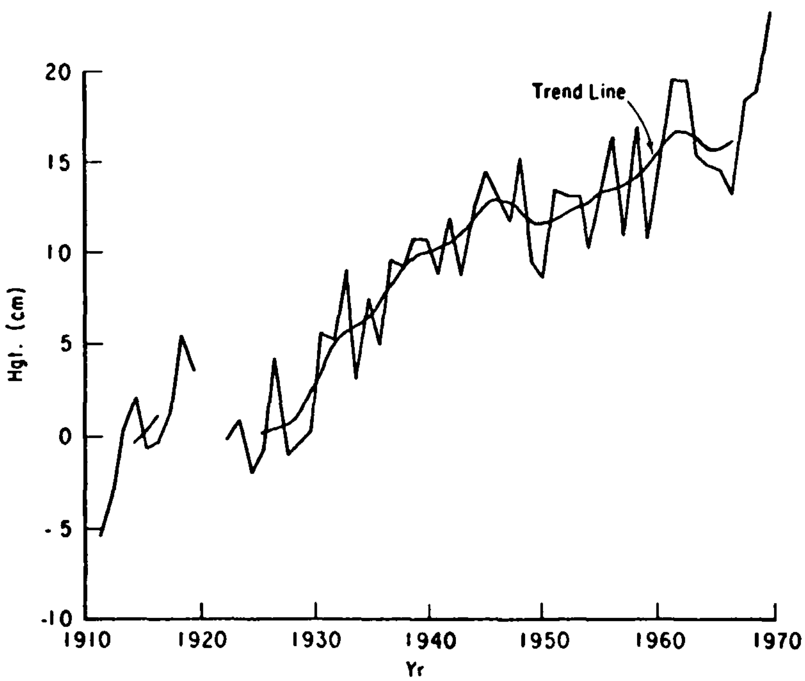

Figure 19. Change in sea level with respect to adjacent land for Atlantic City, 1912 to 1969 (Hicks, 1973).

Table 4. Summary of physical characteristics at Atlantic City.

Characteristic	Description								Source
Location	Absecon Island, 13 km long; coastline orientation of N. 64° E.								
Length of study area	5 km, from Absecon Inlet Jetty SW.								
Mean tidal range	1.25 m								National Oceanic and Atmospheric Administration (1979)
Spring tidal range	1.52 m								National Oceanic and Atmospheric Administration (1979)
Maximum storm surge[1]	2.13 m (Aug. 1971)								National Oceanic and Atmospheric Administration (1972)
Mean significant wave height Standard deviation	0.81 m (less than 1 pct exceed 3 m) 0.53 m								Thompson and Harris (1972) Thompson (1977)
Mean wave period Standard deviation	8.18 s 2.43 s								Thompson and Harris (1972) Thompson (1977)
Breaker type	44.7 pct plunging (PL) 32.0 pct spilling (SP)								Visual obsns. (Jan. 1968 to Oct. 1974)
Breaker approach	57.7 pct within 5° either side of shore-normal 33.0 pct 5° to 25° left of shore-normal								Visual obsns. (Jan. 1968 to Oct. 1974)
Beach material	Fine-to-medium grain quartz sand								Ramsey and Galvin (1977)
Median diameter	0.27 mm								Ramsey and Galvin (1977)
	Profile								
	1	2	3	4	5	6	7	Avg.	
Foreshore slope	0.039	0.066	0.047	0.046	0.046	0.039	0.045	0.047	Everts, DeWall, and Czerniak (1974)
Berm width from Boardwalk (m)	180	5	75	50	60	90	110	80	Everts, DeWall, and Czerniak (1974)
Berm height above MSL (m)	1.3	2.3	3.0	2.4	2.2	2.1	2.0	2.2	Everts, DeWall, and Czerniak (1974)

[1]During BEP program.

1929). All survey work for profile documentation was performed by the U.S. Army Engineer District, Philadelphia. Profile line documentation is discussed further in Appendix A.

2. Frequency of Surveys.

The general criteria considered in establishing survey frequencies were the periods of maximum beach change caused by seasonal effects as well as weather forecasts indicating a high probability of beach erosion due to storms. Survey frequency was greatest during the fall and winter months with a particularly large number of surveys taken during the first quarter of 1963, at the beginning of the project, and in 1968-70 when a series of 10 weekly surveys was done. Figures 20 and 21 show the number of surveys at Atlantic City by quarter (3 months) and by month, respectively.

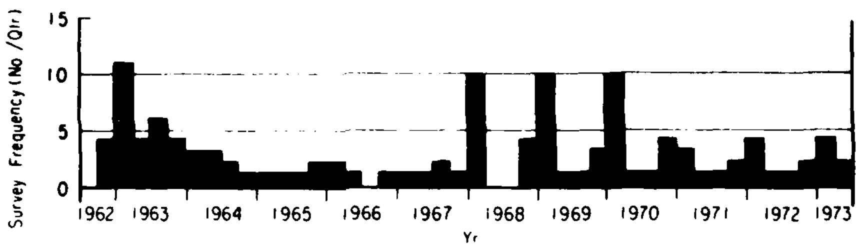

Figure 20. Frequency of surveys at Atlantic City.

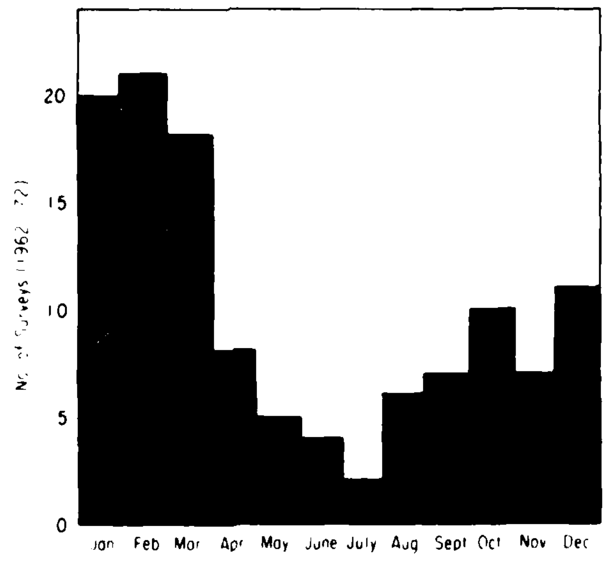

Figure 21. Total number of beach profile surveys, by month, at Atlantic City.

Surveys were initially intended to be conducted every 2 weeks and after significant storms. However, an examination of the initial surveys showed that the engineering significance generally associated with beach changes in a 2-week period was of limited value. Therefore, the interval between regularly scheduled surveys was extended to 1 month or even longer during the summer.

3. Field Survey Technique.

The general data collection procedure consisted of setting up a surveyor's level at or near a previously established point of known elevation or "bench mark," usually located on the seaward side of the Boardwalk (Figs. 22 and 23). Then, using a tape and Philadelphia rod, readings were taken along each profile line at approximately every 15 meters or at breaks in slope. Profile alinement was maintained by sighting on preestablished predominant landmarks such as telephone poles or buildings along the Boardwalk. Horizontal distances were recorded to the nearest 0.3 meter and elevations to the nearest 0.03 meter, except when hand leveling was used.

Figure 22. Surveying crew setting up for another reading (16 January 1968).

When the Philadelphia rod reached an elevation where it was out of view through the level, the general procedure was to hand level down to the surf with the rodman wading out as far as possible. Occasionally, the rod was "boosted" (or raised) a known distance to the top of the rodman's boot or belt to obtain the last point without hand leveling. Turning points were also used; however, before 1972 the leveling was not closed back to either the turning points or to the starting bench mark, so the reliability of the turning points could not be determined.

The surveying party consisted of a six-man hydrographic surveying crew from the Philadelphia District, except for a period in 1963 and 1964 when a private firm was contracted to do the work. The six-man crew either worked as

Figure 23. Rodman in the surf (16 January 1968).

a single crew or split into two three-man crews to expedite the work. The crew also collected sand samples at various times at selected profile lines.

In addition to surveys by conventional surveying methods, an experimental program was conducted to test a method of obtaining profiles by observing sand levels on pipes located at approximately 15-meter intervals along selected profile lines (Urban and Galvin, 1969). Profile lines 5 and 7 at Atlantic City were selected for this program.

To establish the pipe profiles, 6.4-meter-long iron pipes (marked at 0.15-meter intervals and usually marked before emplacement) with 3.8-centimeter (inside) diameters were jetted 4 meters into the sand. A type of reflecting material or a sign was displayed on the pipes as a safety measure for beach buggy traffic at night.

Unpaid local observers enlisted by the Philadelphia District made weekly observations of the sand elevation at each pipe. These observations were recorded on forms and mailed weekly to CERC. At CERC, the sand elevations were converted to elevations above MSL and the data were stored in the standard survey format. These data are available in Urban and Galvin (1969).

4. <u>Accuracy of Field Surveys.</u>

A certain degree of error is inherent in any data collection procedure, even under the most ideal conditions. Some of the possible errors encountered throughout these surveys are discussed below.

Random reading errors were minimized by using a rod graduated in tenths of a foot. Since the only readings requiring a greater precision (to the nearest hundredth of a foot) were at the bench mark and at turning points, and these sight lengths were usually less than 76 meters (250 feet), no significant random error should occur (Czerniak, 1972).

Systematic errors due to condition of the level, rod out of plumb, temperature of tape, slope of tape, and tape not on line were considered insignificant and had no great effect on the data collected. Bad turning points undoubtedly resulted in some error, but since the leveling was not closed back to the bench mark, there is no definite method of determining specifically when an error might have occurred or to what extent. Another source of systematic error results from the sag of the tape and wind effects on taping. The magnitude of this error is assumed to be an average maximum of -0.1 foot per 200 feet of tape length.

Taking into account these error possibilities and various other errors due to human and environmental causes, the data were considered "accurate" if every point on the profile was within ±0.05 foot vertically and ±0.5 foot horizontally of the actual values. The data were also considered "dependable" if sufficient checks on the survey data were performed to ensure that no personal errors affected the data. Based on these criteria, it was concluded that the data obtained were of acceptable accuracy and dependability.

5. Data Reduction and Quality Control.

Until 1968, survey data were recorded in field notebooks, reduced and hand-plotted by the surveyors, and then forwarded to CERC. These plots were later digitized and placed in a punchcard format. After 1968, the survey data were still recorded in fieldbooks, but the data were then transferred to optical scanning forms before being sent to CERC. At CERC the data were logged and scanned with an optical mark page reader (OMPR) to produce punchcards. The cards were then read into a computer where the data were processed using an editing program which plotted profile points. From these plots, apparent errors were identified and returned to the surveyors for correction or comment. A final edit check was made and the data were stored in a magnetic-tape format when all detectable errors were satisfactorily corrected.

A quality control study by Czerniak (1973) indicated a 25 percent probability that there would be an error of ±0.1 foot in the recorded elevation of a surveyed point due to rounding by the survey party in the field. Because of the improbability of this rounding error occurring numerous times on the same profile, this error, if present, should have no adverse affect on any data analysis.

Figure 24 diagrams the basic steps taken throughout the BEP program from the initial observation in the field to the final computer output.

Appendix B provides a tabulation, by profile, of all the survey data collected during the study.

6. Data Analysis.

Two primary parameters calculated from the profile data are (a) the change in MSL shoreline (ΔS) and (b) the change in unit storage volume (ΔV). The first parameter, ΔS, is the horizontal change, between surveys, of the position of MSL at a profile line. If the beach at MSL prograded during the time between surveys, a positive number would result for ΔS; a negative value would result if the beach receded. The second parameter, ΔV, is the change in volume above MSL between two surveys for a unit width parallel to the shoreline at a profile line. If accretion occurs between surveys, ΔV will have a positive value, and if erosion occurs, ΔV will be negative.

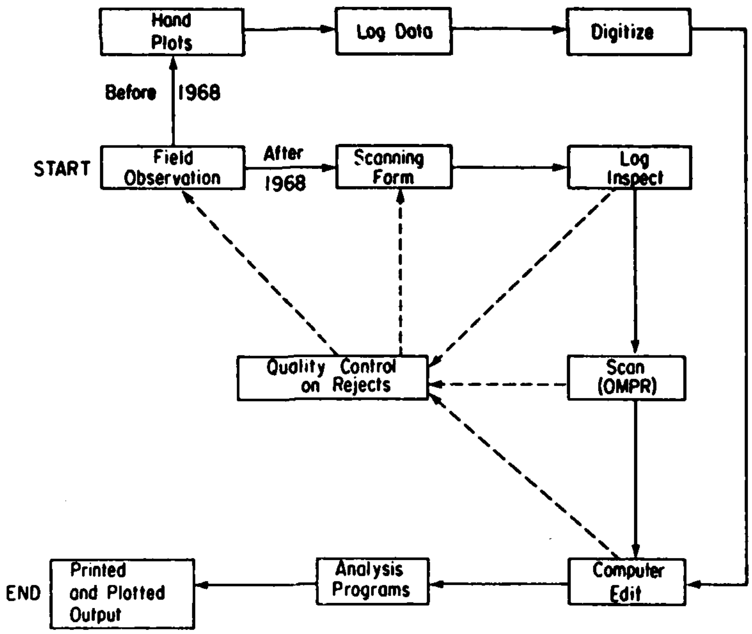

Figure 24. BEP data processing.

The values for ΔS and ΔV are limited in two significant ways (see Figs. 25 and 26). The lower limiting elevation of the surveys for computational purposes is MSL and therefore the values do not provide any indication of changes below MSL. The volume computations are also based on a landward boundary, common to most of the surveys, for each profile line. As a result of these two limiting factors, there generally exists a landward region of change as well as the probably more substantial below-MSL region of change which are not included in the computed volume.

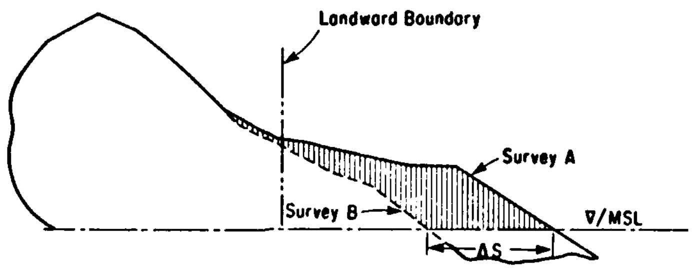

Figure 25. Change in MSL shoreline at profile line, ΔS.

IV. RESULTS

1. Short-Term Changes.

a. Changes During Storms. Storms contribute substantially to short-term beach profile changes by their very nature of short duration and high

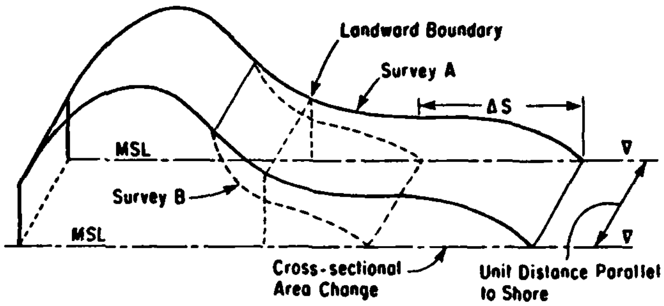

Figure 26. Change in unit storage volume at profile line, ΔV.

intensity. Seventeen storms, predominantly northeasters, were selected for analysis based on the following criteria (see Table 5):

(1) Existence of prestorm surveys no more than 4 weeks before the storm and poststorm surveys no more than 1 week after the storm;

(2) data indicating wave heights of 1.22 meters or greater during the storm (this value was arbitrarily chosen due to the 0.85-meter value for mean wave height determined by Thompson and Harris, 1972); and

(3) no other known significant weather events occurring between surveys.

Visual observations indicate that the predominant breaking wave directions during storms are from the east and southeast. Wave breaker types most commonly observed were either plunging or spilling (Urban and Galvin, 1969). Analysis of the selected storms for which actual tide data were available demonstrated an average maximum storm-generated surge at high water of 0.57 meter.

An effect which must be considered is the timelag between the storm and the poststorm survey which varies from 0 to 6 days. The greater the lag, the more probable that the beach has already begun recovering, thereby not indicating the total storm change (Birkemeier, 1979). (See App. C for plots of prestorm and poststorm surveys.)

Figure 27 depicts the mean and standard deviation of unit volume changes above MSL, by profile, for the selected storms. Due to the relatively few storms analyzed, this information provides only a possible trend of unit volume changes at each profile line. Profile lines 2, 5, 6, and 7 underwent the greatest average unit volume loss of 6 cubic meters per meter or greater during these storms. This is partly explained by the fact that the general direction of longshore transport during storms is from northeast to southwest in this area. Consequently, profile lines 2 and 5 are in littorally depleted locations as a result of updrift groins and other manmade obstructions to littoral drift (see Fig. 3). However, profile lines 6 and 7 are on relatively unobstructed beach, so their changes in unit volume are presumably due to onshore-offshore sand movement, or possibly movement downshore into the unsurveyed part of Absecon Island.

The wide deviation at profile line 1 is undoubtedly a direct consequence of its location immediately downdrift of the Absecon Inlet jetty. Profile line 4, on the other hand, indicates a zero average unit volume change in

Table 5. Atlantic City storm data.

Storm date	Survey dates	Days before survey (No.)	Days after survey (No.)	Max. HW surge (m)	Max. HW surge (ft)	Dates of max. HW surge	HW surges ≥0.61 m	HW surges ≥0.3 m	Max. wave hgt. (m)	Max. wave hgt. (ft)	Source	Dates of max. wave hgt.	MSL shoreline chg. avg.[1] (m)	MSL shoreline chg. std. dev. (m)	Above MSL unit vol. chg. avg.[1] (m^3/m)	Above MSL unit vol. chg. std. dev. (m^3/m)
13 Jan. 1964	31 Dec. 1963 to 17 Jan. 1964[2]	13	4	0.66	2.17	13 Jan. 1964	1	3	3.96	13.00	Gage	----------	2.72	4.89	-20.40	25.23
23 Sept. 1964	31 Aug. to 25 Sept. 1964[2]	23	2	0.23	0.77	22-23 Sept. 1964	0	0	4.88	16.00	Gage	----------	-2.68	12.99	-22.99	22.07
16 Sept. 1967	15-19 Sept. 1967	1	3	0.73	2.38	16 Sept. 1967	1	2	2.74	9.00	Gage	----------	-5.90	10.70	-8.18	25.63
25 Jan. 1968	24-30 Jan. 1968	1	5	0.54	1.78	25 Jan. 1968	0	3	1.22	4.00	Visual	26 Jan. 1968	0.14	5.11	-5.82	9.56
8 Feb. 1968	30 Jan. to 8 Feb. 1968[2]	9	0	0.66	2.18	8 Feb. 1968	1	1	1.98	6.50	Visual	8 Feb. 1968	-0.27	4.48	-6.02	7.86
25 Feb. 1968	21-26 Feb. 1968	4	1	0.24	0.78	25 Feb. 1968	0	0	1.22	4.00	Visual	25 Feb. 1968	-5.90	13.19	-0.32	5.93
1 Mar. 1968	26 Feb. to 7 Mar. 1968	4	6	0.63	2.08	29 Feb. 1968	1	1	1.83	6.00	Visual	1 Mar. 1968	1.83	11.00	1.88	3.35
13 Mar. 1968	7-13 Mar. 1968	6	0	0.45	1.48	12 Mar. 1968	0	1	1.83	6.00	Visual	8 Mar. 1968	-4.90	8.19	-2.33	9.75
									2.93	9.61	Gage	20-25 Jan. 1969	----	----	----	----
22 Jan. 1969	13-22 Jan. 1969	9	0	0.38	1.26	21 Jan. 1969	0	3	1.52	5.00	Visual	21-22 Jan. 1969	-3.83	8.33	-12.64	9.52
									1.74	5.70	Gage	9 Feb. 1969	----	----	----	----
10 Feb. 1969	5-12 Feb. 1969	5	2	0.51	1.66	9 Feb. 1969	0	1	1.22	4.00	Visual	9 Feb. 1969	-2.03	5.17	0.73	7.19
18 Feb. 1969	12-19 Feb. 1969	6	1	0.48	1.56	18 Feb. 1969	0	4	1.52	5.00	Visual	18-19 Feb. 1969	0.40	6.24	-5.48	11.10
									1.22	4.00	Visual	28 Feb. 1969	----	----	----	----
2 Mar. 1969	26 Feb. to 5 Mar. 1969	4	3	0.75	2.46	2 Mar. 1969	3	10	2.73	8.96	Gage	27 Feb. to 3 Mar. 1969	6.99	8.65	-11.01	23.96
									1.67	5.48	Gage	7-8 Mar. 1969	----	----	----	----
7 Mar. 1969	5-12 Mar. 1969	2	5	0.48	1.56	7 Mar. 1969	0	3	1.22	4.00	Visual	7-8 Mar. 1969	-3.43	7.17	5.10	11.30
11 Dec. 1969	20 Nov. to 16 Dec. 1969	21	5	No tide data	No tide data	-----------	---	---	1.37	4.50	Visual	9 Dec. 1969	0.80	10.16	2.33	14.11
17 Dec. 1970	9-18 Dec. 1970[2]	8	1	0.91	3.00[3]	-----------	---	---	3.35	11.00	Gage	17 Dec. 1970	3.60	10.14	-1.21	30.70
19 Feb. 1972	14-22 Feb. 1972	5	3	1.07	3.50	19 Feb. 1972	1	5	2.13	7.00[4]	Visual	19 Feb. 1972	2.64	6.89	-14.83	14.39
22 Mar. 1973	16-25 Mar. 1973[2]	6	2	0.78	2.57	22 Mar. 1973	4	8	1.37	4.50[4]	Visual	22 Mar. 1973	11.80	7.47	-11.60	25.23
Avg.		7.47	2.53	0.57	1.88		0.8	3	2.08	6.33						

[1]Simple average of profile values (negative values indicate recession-erosion).

[2]Not all profiles reached MSL.

[3]Data from Sandy Hook, New Jersey.

[4]Data from Ludlam Island, New Jersey.

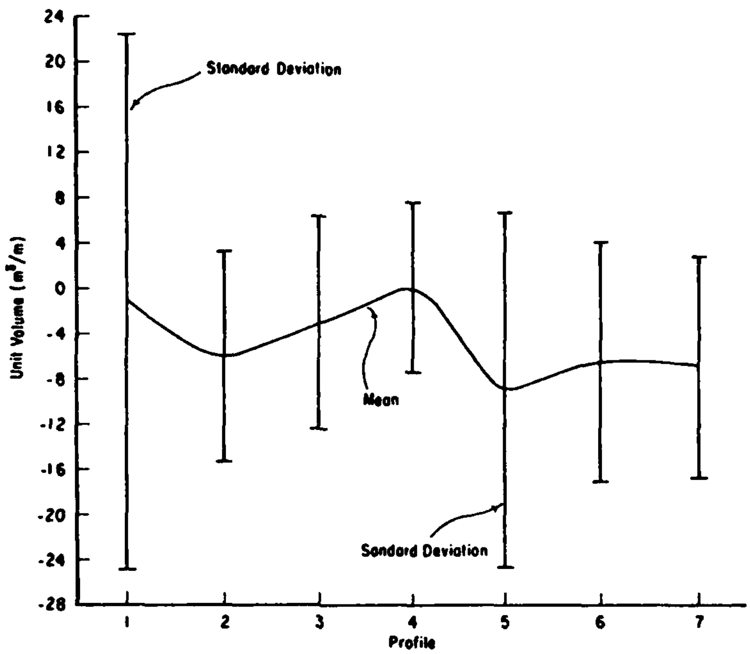

Figure 27. Mean and standard deviation of unit volume changes by profile for 17 selected storms at Atlantic City.

addition to having the smallest deviation of all profiles. Profile line 4, therefore, appears to maintain a reasonably stable unit volume throughout storms. This apparent anomaly may possibly be related to the number and type of structures near the profile; i.e., Steel Pier and Steeplechase Pier updrift of the profile, as well as two groins located on either side of Steel Pier (Table 1). In addition, another groin located just downdrift of the profile causes a "boxed-in" effect which could possibly contain a bulk of the littoral material.

Figure 28 illustrates the mean unit volume changes and standard deviations by contour above MSL for all profile lines during the selected storms. The greatest average unit volume loss occurs between the +0.5- and +1.0-meter contours. The figure also shows that the greatest deviations from the mean occur between the 0.0- and +2.0-meter contours. This is to be expected because wave action is concentrated in the foreshore region and thereby lends to greater variations in volumes of material moved. Also, it is possible that the maximum average unit volume loss occurs between the +0.5- and +1.0-meter contours because the average maximum surge above high water, which allows waves to concentrate, during those storms is 0.57 meter. Alternately, the variation in volume change generally decreases with increasing elevation above +2.0 meters because this part of the profile remains relatively stable, except in severe storms, due to its increased distance from the scouring effects of wave action. This higher part of the beach not only remains relatively stable, but it accretes an average of 0.21 cubic meter per meter per storm between the 3.0- and 3.5-meter contours.

Since losses from the lower contours clearly exceed gains along the upper contours, sand is moving either offshore or alongshore. The most intense storms resulted in -20 cubic meters per meter volume changes above MSL, which

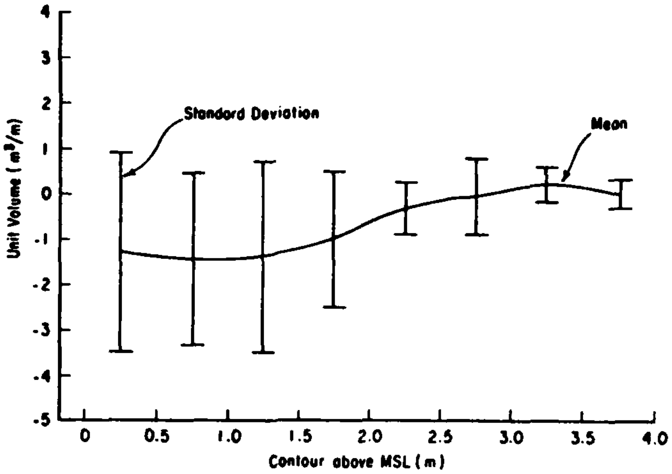

Figure 28. Mean and standard deviation of unit volume changes by contour for 17 selected storms at Atlantic City profile lines.

is -100,000 cubic meters over the 5-kilometer study area compared to the gross annual longshore transport rate of about 500,000 cubic meters (for the entire littoral zone); this short-term beach erosion indicates that most of the sediment transport during storms is offshore.

In Figure 29 the unit volume changes at each profile, as determined from prestorm and poststorm survey data, are compared to the changes in MSL shoreline position (0.0 contour) for the same storm data. In this way, volume changes resulting in accretion and erosion are compared to shoreline changes resulting in progression (advancement) and recession (retreat). Figure 30, which depicts trends in volume change versus shoreline change for selected storms, shows considerable differences between these two values, indicating, at least during storms, that volume accretion is not necessarily accompanied by MSL shoreline progression nor is volume erosion always accompanied by MSL shoreline recession. These data demonstrate the need for caution when evaluating short-term beach changes from aerial photos.

b. Beach-Fill Changes. Two major beach-fill projects at Atlantic City during the BEP study (in 1963 and 1970) used a combination of stockpiling and direct placement. Stockpiling entails periodically placing beach material at a concentrated updrift location in the depleted area, and allowing natural processes to move the fill downdrift to nourish the beach. Direct placement involves placing the fill along the entire area to be nourished.

As mentioned previously, the 1963 fill project consisted of 428,000 cubic meters of fill placed between Oriental and Virginia Avenues to replenish the greatly eroded beach resulting from the March 1962 storm. Figures 31 and 32 indicate the 1963 and 1970 beach-fill limits and the beach profiles before and after both fills. Figure 33 shows the unit volume change from 1963 to 1972 for each profile line. These data indicate that the 1963 fill remained for approximately 4 years on profile line 3 and provided nourishment to profile lines 4 to 7 at later times as a result of natural processes, as indicated by the dashline tracing volume increases along the profile lines. However, those same natural processes caused a continued erosion problem that required the

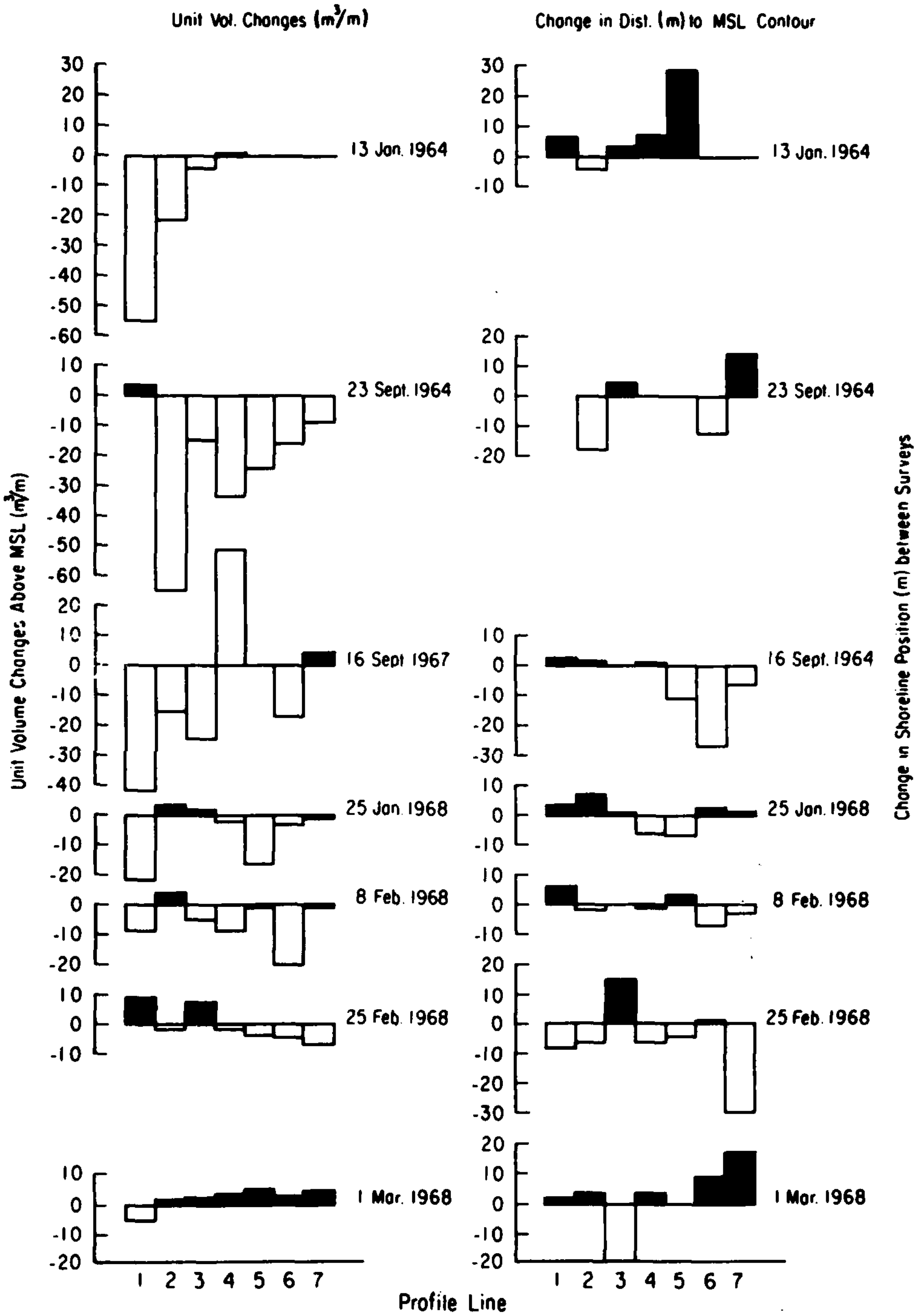

Figure 29. Comparison of unit volume changes and MSL shoreline position changes by profile for 17 selected storms.

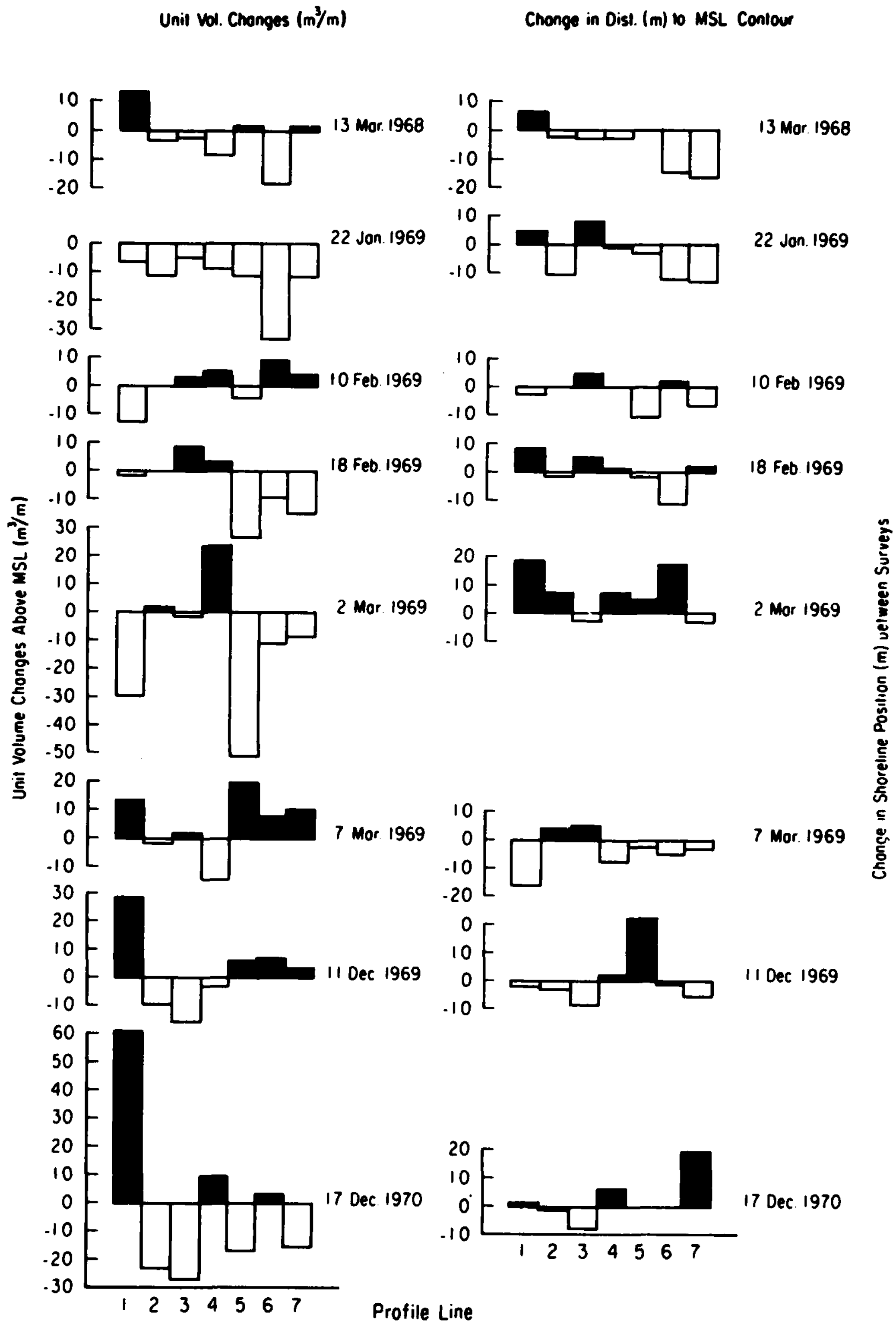

Figure 29. Comparison of unit volume changes and MSL shoreline position changes by profile for 17 selected storms.--Continued

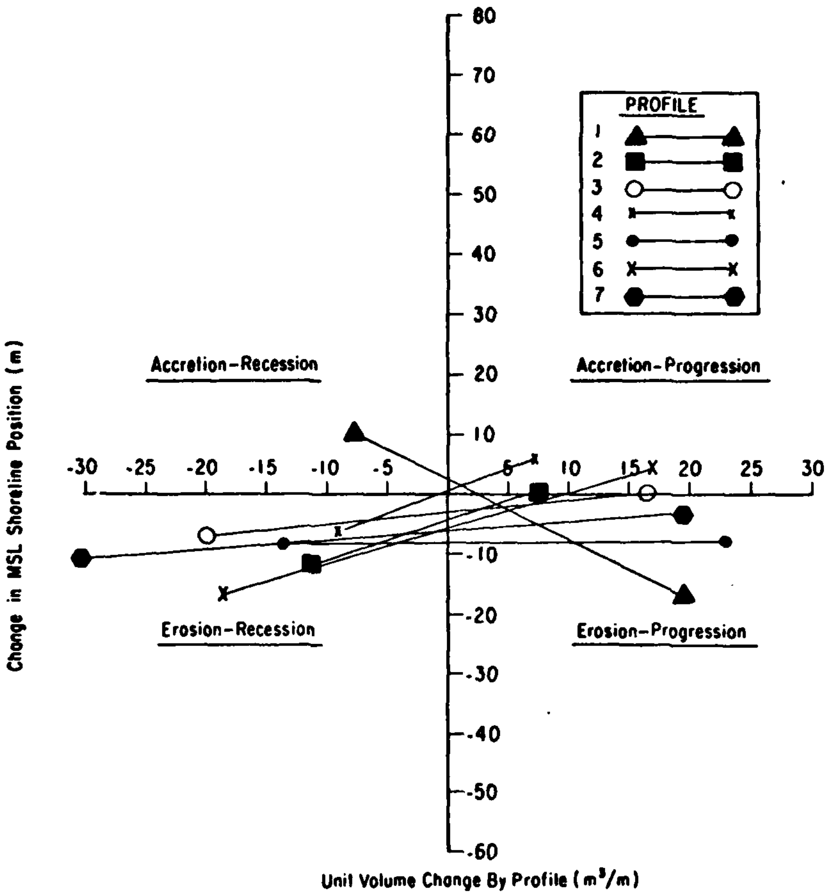

Figure 30. Trends in volume change versus shoreline change for 17 selected storms.

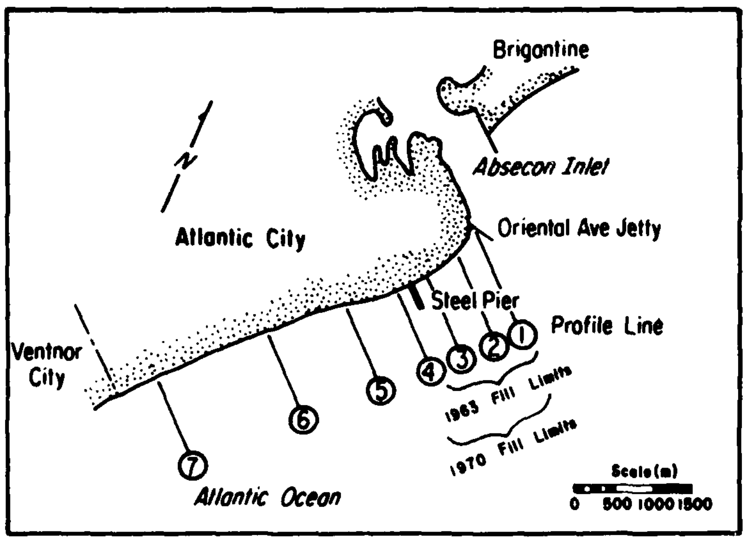

Figure 31. Limits of 1963 and 1970 beach fills at Atlantic City (Everts, DeWall, and Czerniak, 1974).

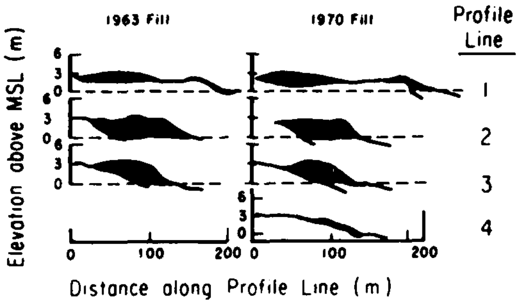

Figure 32. Cross section of beach from profiles taken before and after beach nourishment in 1963 and 1970 (from Everts, DeWall, and Czerniak, 1974).

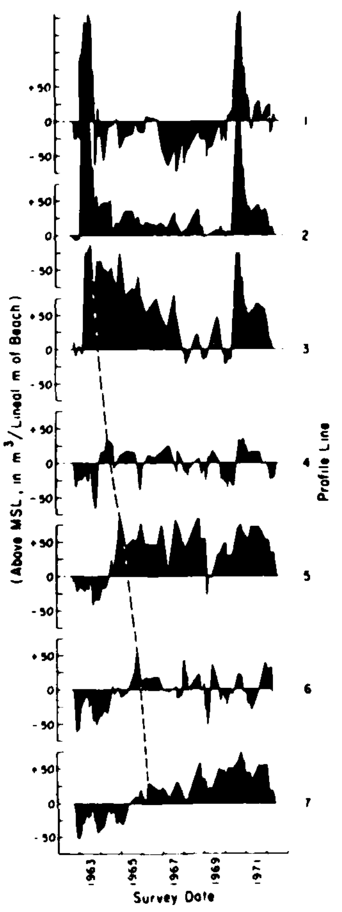

Figure 33. Sediment volume measurements between surveys relative to first survey ("zero" unit volume is the volume during the first survey in October 1962). Dashline indicates probable alongshore movement of some volume of the beach fill as determined by volume increases along profile lines 4 to 7 (Everts, DeWall, and Czerniak, 1974).

placement in 1970 of an additional 635,000 cubic meters of beach material between Oriental and Illinois Avenues (see Figs. 31 and 32). The fill material in each case was similar to the natural beach material, with a mean grain size of 0.3 millimeter. Again in 1970, profile line 3 indicated a trend to maintain much of the fill for an extended time period (Fig. 33). Although surveys were not conducted after 1973, it can be assumed that some of the fill migrated down the beach to the other profile lines as did some of the 1963 fill. Some information supporting this assumption is shown by comparing the photos in Figures 34 and 35 (taken in November 1970) with the photos in Figures 36, 37, and 38 (taken in March 1979 at profile line 2). Note the considerable amount of beach after the beach fill in 1970, compared to the practically nonexistent beach in 1979. Also, note the wide beach in Figure 39 (taken at profile line 6 in March 1979) compared to the lack of beach in Figures 36 and 37.

Figure 34. View of scarp just north of profile line 2 (24 November 1970).

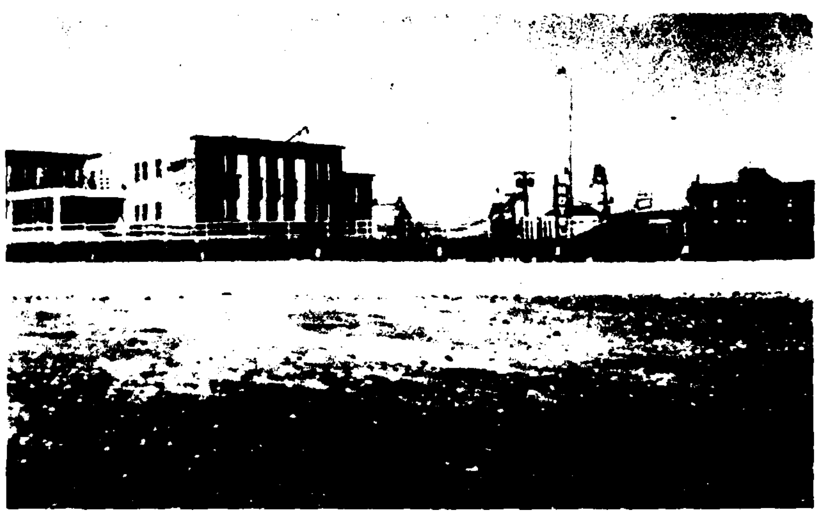

Figure 35. View landward from waterline at profile line 2. Building at left, behind Boardwalk, is convalescent home shown in Figure 38 (24 November 1970).

Figure 36. View of groin at Vermont Avenue from under the Boardwalk at Rhode Island Avenue (profile line 2) (9 March 1979).

Figure 37. View of groin south of Rhode Island Avenue from under the Boardwalk at profile line 2 (9 March 1979).

Figure 38. View of erosion-scour at the base of the convalescent home on the south side of Rhode Island Avenue (8 March 1979).

Figure 39. Looking shoreward from waterline at California Avenue (profile line 6) on 9 March 1979. Note width of beach compared to that at profile line 2 in Figures 23 and 34.

Additional short-term changes that primarily affect the upper sections of the profiles result from the periodic removal of sand from under the Boardwalk (see Figs. 40, 41, and 42) for use as fill elsewhere on the beach (see Fig. 43). Although this procedure has been observed, it is not well documented in terms of frequency or quantities of material transferred. The project during the winter and spring of 1979 was done by the City and called for the removal of 36,600 cubic meters of sand from under the Boardwalk near profile line 7 (Richmond to Raleigh Avenues) (M. Ingram, City Engineer, personal communication, March 1979). This material was then placed on the foreshore midway between profile lines 4 and 5. Because of the relatively fine size of this well-sorted sand (0.18 millimeter compared with 0.27 millimeter reported by Ramsey and Galvin, 1977, for average foreshore sand size in March), the material would probably be easily eroded from the beach face.

Figure 40. Borrow site under Boardwalk at Richmond Avenue on 9 March 1979. Note amount of sand removed by comparison to sand still evident behind and under Boardwalk (compare also to Fig. 39).

Figure 41. Trucks waiting to be filled with sand near Raleigh Avenue (9 March 1979).

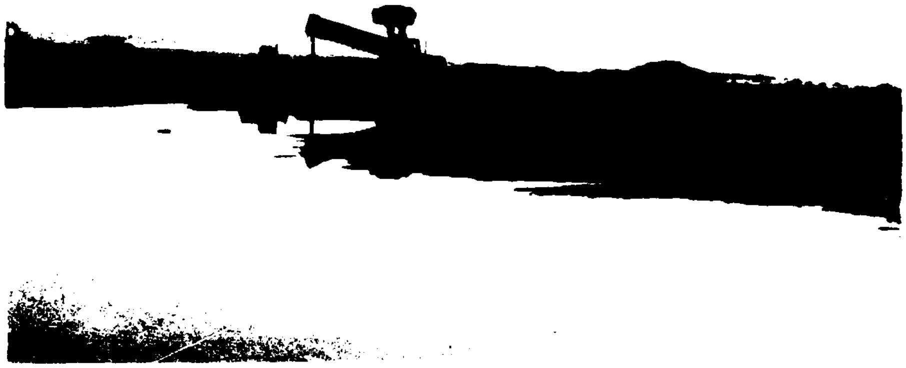

Figure 42. Front loader filling truck with sand excavated from under the Boardwalk near Raleigh Avenue (9 March 1979).

Figure 43. Site of beach fill near St. James and New York Avenues (9 March 1979).

2. Long-Term Changes.

Long-term changes include the cyclic seasonal changes (U.S. Army, Corps of Engineers, Coastal Engineering Research Center, 1977) along with longer range trends which may or may not be cyclic in nature. Changes in the MSL shoreline position during 1962-73 are shown in Figure 44. The 1963 and 1970 beach fills are evident on profile lines 1, 2, and 3 with subsequent progradation on the downdrift profiles, which was also shown in the unit volume changes (Fig. 33). Figure 45 depicts the average unit volume and MSL shoreline position by month for each of the profile lines. The mean of the monthly averages for each profile is indicated by the "zero" unit volume, whereas the "zero" MSL shoreline position is the shoreline position during the first survey. Figure 45 shows that seasonal changes do occur at Atlantic City, with the least volume of sand on the beach from January to March and the greatest volume of sand generally from June to August. This large quantity of sand also appears predominantly on profile lines 1, 2, and 3 with profile lines 5, 6, and 7 showing a loss of sand during June and July. These extremely large volumes at profile lines 1, 2, and 3 predominantly reflect the beach fill of 1963 in which the bulk of the fill material was placed along these profile lines as shown in Figure 32. These values may also be misleading since only four surveys were conducted in June and two in July throughout the 11-year study period, with each of the profile lines surveyed twice during June, July, and August of 1963 after the 1963 beach fill. June and July were the least surveyed months during the study period (Fig. 21). In addition, all profile lines were surveyed in August 1970 after the 1970 beach fill, thereby adding a bias to the six surveys conducted in August throughout the study. Therefore, the information for these months is less representative of average summer conditions.

To evalute the entire Atlantic City locality as a whole, ΔS and ΔV were averaged by year in the alongshore direction. The averaged alongshore change in MSL shoreline, $\Delta\bar{S}$, is computed by summing the alongshore distance-weighted yearly average values of ΔS at each profile line and dividing by the total length of the study area. Similarly, the averaged alongshore change in storage volume, $\Delta\bar{V}$, is computed using the alongshore distance-weighted values of ΔV (Czerniak, 1974).

A comparison of the mean yearly changes in storage volume and MSL shoreline (Fig. 46) shows that the long-term trends are influenced more by the *magnitude* of the accretion-erosion and progression-recession occurring in these years than by the *number* of net accretionary or erosional years. This is clearly indicated by the high dependency on the two artificial beach fills in 1963 and 1970 for the shape of the cumulative yearly change in storage volume, $\Delta\bar{V}$ (Fig. 46). In conjunction with this, yearly changes in the MSL shoreline and storage volume vary considerably and appear to suggest no clear pattern.

Figure 47 shows the changes in unit volume and shoreline position for the years between the beach nourishment projects in 1963 and 1970. The slope of a least square fit line drawn through the points on the plot of cumulative average yearly change in storage volume for the seven profile lines (Fig. 47) provides a single number which best describes the rate of "natural" change in the above MSL storage volume during this period. The line only provides a general description of the trend in the data due to the wide yearly variation

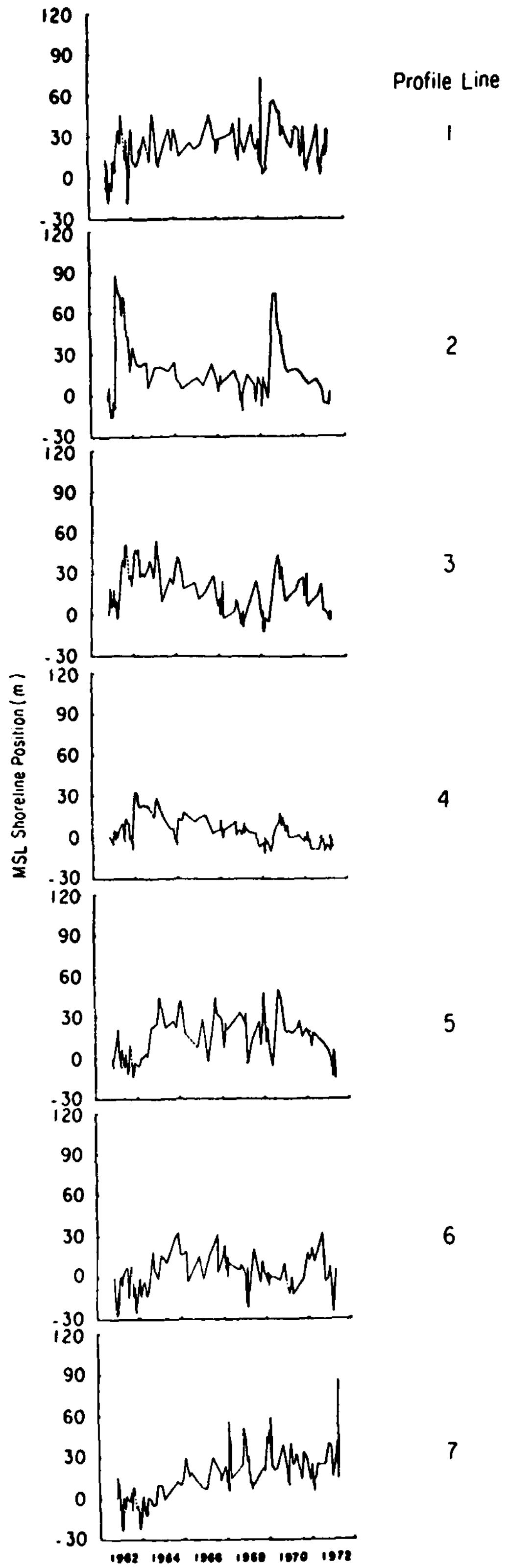

Figure 44. MSL shoreline changes in time (missing data shown by dashline).

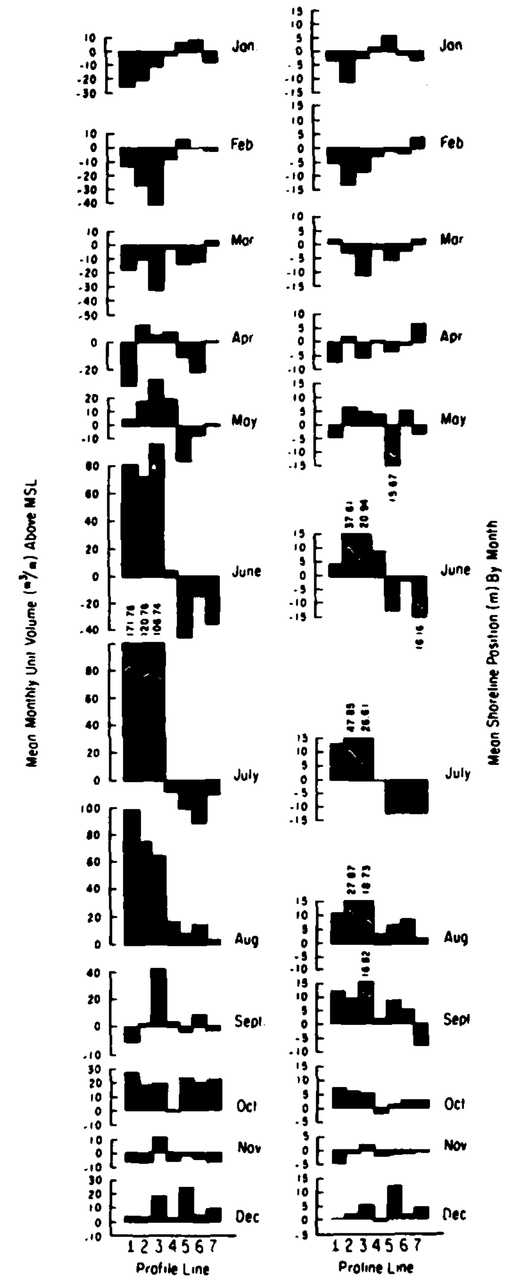

Figure 45. Mean above MSL unit volume changes and MSL shoreline position changes by month (24 October 1962 to 1 May 1973).

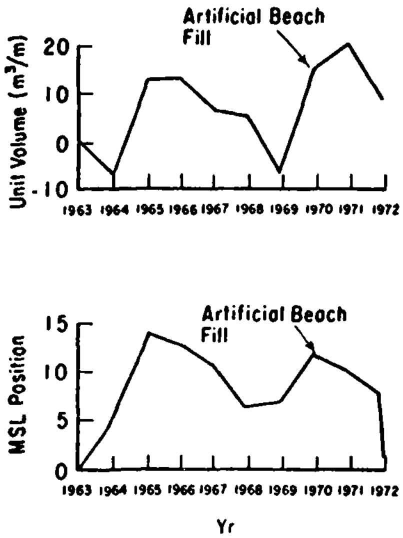

Figure 46. Cumulative yearly change in unit volume and MSL shoreline at Atlantic City.

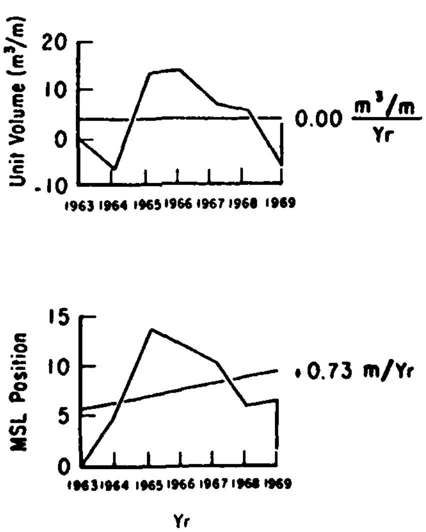

Figure 47. Long-term changes in unit volume and MSL shoreline from 1963-69 to eliminate effects of 1970 beach fill.

(Fig. 33). Under these conditions, Figure 47 indicates that Atlantic City has remained stable at 0.00 cubic meter per meter per year change above MSL during the period from 1963 to 1969.

Applying the same procedure to the change in MSL shoreline over the same period, the rate of change in the MSL shoreline indicates a progression of 0.73 meter per year. However, this line likewise represents only a general trend and only roughly approximates the actual rates of change in MSL shoreline for the locality.

Further information on the MSL shoreline changes and the above MSL unit volume changes through time by profile line is provided in Appendixes D and E, which are large-scale figures by profile of Figures 44 and 33, respectively.

V. DISCUSSION

1. Profile Changes.

In a study by the Beach Erosion Board (1950), various shoreline positions from 1841 to 1947 were compared to determine a trend in shoreline advance and retreat along the beaches at Atlantic City. It was found that considerable shoreline retreat occurred at the inlet entrance from 1841 to 1936. After 1936 the inlet shoreline remained reasonably stable due to the installation of protective structures such as bulkheads and groins. The greatest natural change at the inlet entrance from 1936 to 1947 was a progressive lowering of the beach.

The ocean shoreline beginning 300 meters northeast of Garden Pier and extending 1.2 kilometers southwest to Central Pier receded between 1936 and 1947 with a greatly accelerating rate after 1939 (Fig. 48). After the placement of a beach fill in 1948, from July 1948 to August 1960, the shoreline between the Oriental Avenue jetty and New Hampshire Avenue experienced progression ranging from a maximum of about 52 meters at the jetty to about 6 meters at New Hampshire Avenue. During this same period the shoreline between New Hampshire Avenue and Steel Pier receded, with few exceptions, from a maximum of about 40 meters between Vermont and Rhode Island Avenues to a maximum of 3 meters in the region east of Steel Pier. The recession between Vermont and Rhode Island Avenues duplicated the shoreline position of 1936 (Fig. 48).

Surveys in July and October 1948, February and May 1949, January 1950, December 1958, August 1959 and 1960, and March 1962 provide detailed profile data for the area between the Oriental Avenue jetty and Steel Pier (U.S. Congress, 1964b). There are no indications, from the previous data, of any definite quantitative trends in volumetric changes along this reach extending from the Boardwalk to approximately 1.8 meters below MLW. Likewise, for the 11-year BEP study, there appears to be no clearly defined trend in volumetric changes throughout the seven selected profiles. The two most significant events are the 1963 and 1970 beach fills and the natural transport of that material downdrift, as shown in Figure 33.

Figure 49 depicts four sets of profiles of the beach and offshore regions from January 1936 to February 1948 (before the 1948 beach fill). These profiles indicate that relative stability increases with distance southwest from the Oriental Avenue jetty and Absecon Inlet.

Profile envelopes for each profile line throughout the study period (App. F) depict the entire range of maximum and minimum elevations surveyed at given distances along the profile line and do not appear to indicate any clear trend to greater stability from profile line 1 to profile line 7.

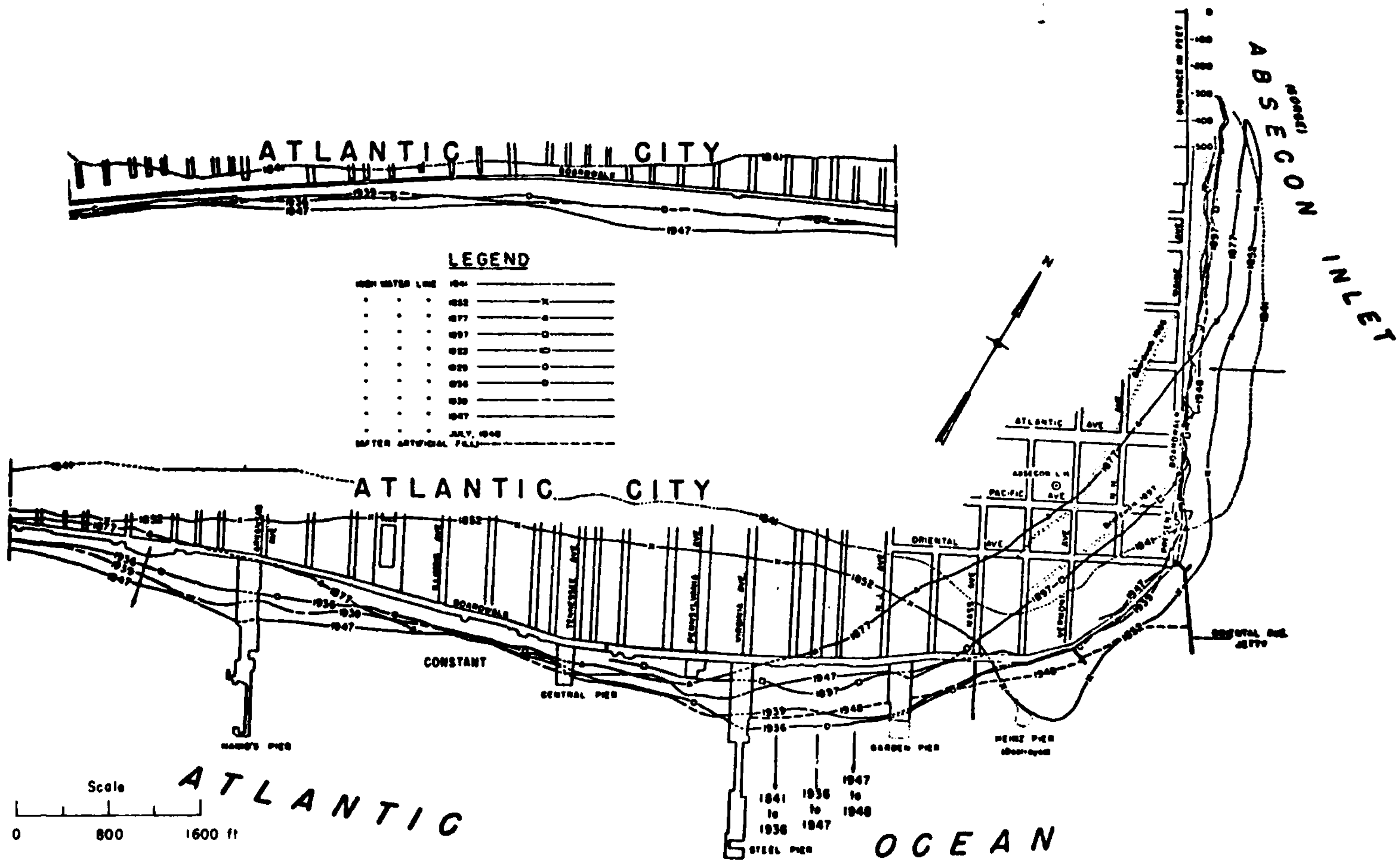

Figure 48. Shoreline changes at Atlantic City, 1841-1948 (Beach Erosion Board, 1950).

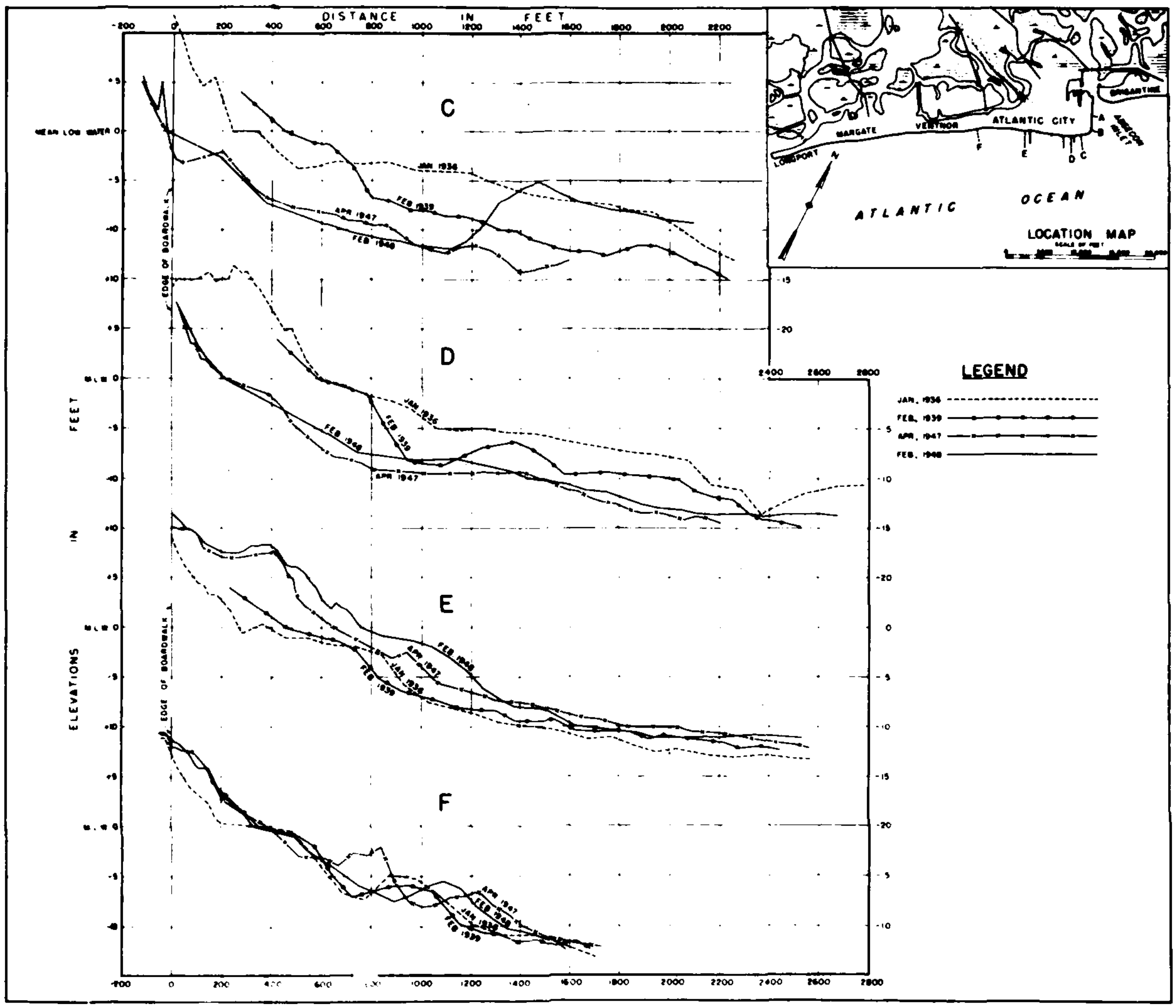

Figure 49. Profile changes along Atlantic City, 1936-48 (Beach Erosion Board, 1950).

2. Seasonal Changes and Wave Climate.

Figure 50 combines mean monthly wave height and period information obtained from Atlantic City and the Toms River Coast Guard Station (Fig. 1) for comparison. Of these sources, the gage data are considered more reliable although the visual observations provide important nearshore wave direction information. The gage data (Thompson and Harris, 1972) were obtained from 7-minute pen-and-ink records taken six times daily from a 7.62-meter relay-type gage located on the seaward end of Steel Pier. The visual observations (made by local volunteers) include estimations of nearshore wave period, height, direction, and breaker type. The Cooperative Surf Observation Program (COSOP) data were also obtained visually by cooperating personnel from U.S. Coast Guard Stations at Atlantic City and Toms River. As shown in Figure 50, there is considerable variation between these sources of wave data.

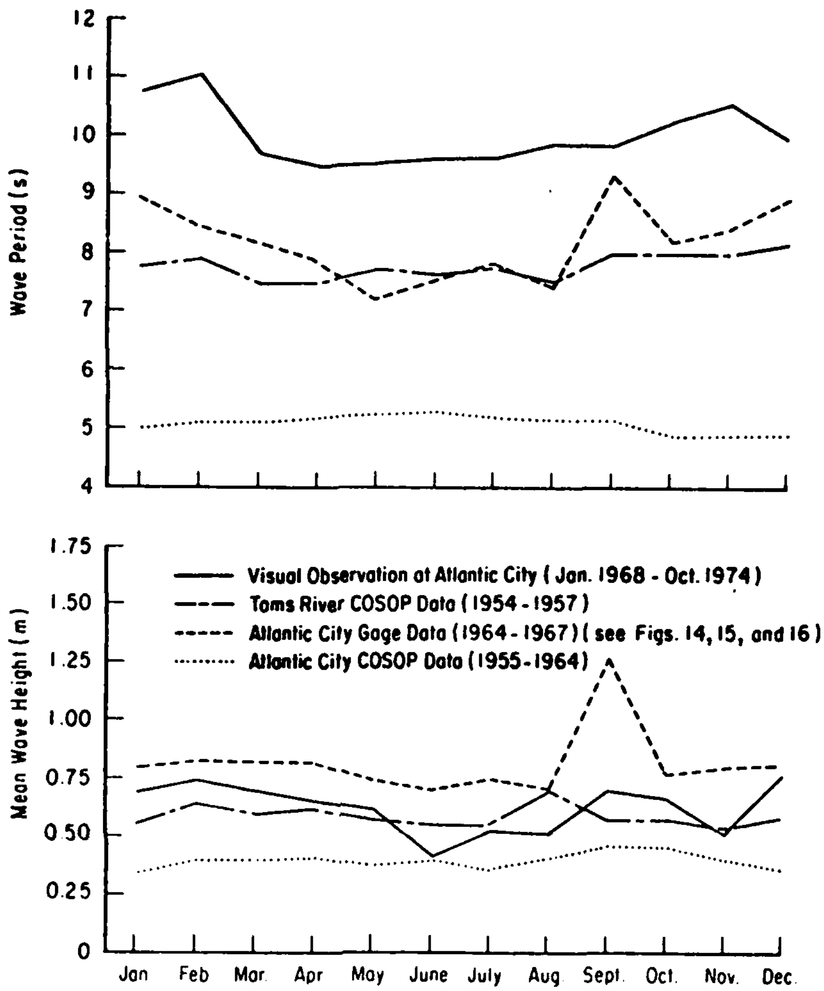

Figure 50. Mean monthly gage and visual data for wave heights and periods for Atlantic City.

The visual observation data indicate that the breaker approach is predominantly from within a sector of 5° to the left of shore-normal to an observer on the beach.

3. Coastal Engineering Implications.

The data in this study largely indicate the far-reaching influence of the two beach fills of 1963 and 1970. Judging from the volumetric and MSL shoreline changes through time, shown in Figures 33 and 44, respectively, the beach fills accomplished their purpose of rebuilding the beach, not only where the fill was directly placed, but also downdrift, as the result of natural littoral processes. The severe erosional condition at profile line 2, however, bears closer examination to determine the specific causes as well as possible solutions to this critical problem.

Among the greatest difficulties in determining how and where the sand is transported are the incomplete surveying of the entire Absecon Island and the

relatively shallow surveying out to only 2 feet below MSL. Therefore, the amount of sand transported offshore or alongshore to the southwest cannot be determined. To better understand the complex and dynamic sediment movement in this area, and thereby arrive at a functional solution, the entire island should be studied as a complete system from Absecon Inlet to Great Egg Harbor Inlet. This would enable a more reliable description of the processes involved along this coastline. More information should also be obtained relating to the processes of the inlets at both ends of the island to enhance the understanding of the impact these inlets have on Absecon Island.

Prestorm and poststorm surveys played an important role in understanding some of the storm-related processses taking place along this coast. Additional surveys of this type would significantly increase the awareness of just how much sand is moved and where during storms, which would then enable the area to plan accordingly before the storm season. Again, this points out the need to survey farther offshore to locate where some of the sand is being transported.

The implications of the beach-fill project in March 1979 indicate the need for careful planning of the time, location, and grain size of the fill material when undertaking such a project. The grain size of the fill material taken from under the Boardwalk for this project was much smaller than the median grain size of the beach material in the vicinity of the nourishment project. This factor, in conjunction with the time of year (March being a highly susceptible time for storm waves), resulted in most of the fill being washed away almost immediately on placement, according to a bulldozer operator on the site. This beach-fill project, then, appeared to be much less successful than the two fills conducted in 1963 and 1970.

VI. SUMMARY

Each of the seven profile lines at Atlantic City, spaced from a minimum of 467 meters to a maximum of 1.62 kilometers apart, was surveyed a minimum of 118 times, generally from the seaward edge of the Boardwalk to wading depth. Frequency of surveys ranged from weekly to quarterly (Figs. 20 and 21). During the study there were 17 reasonably well-documented storms with prestorm and poststorm surveys (Table 5).

The study area extends 5 kilometers southwest from the Absecon Inlet jetty and is comprised of 0.27-millimeter median grain-size quartz sand. The foreshore slope ranges from 0.039 to 0.066 with an average of 0.047 over the seven profile lines. The berm width, measured from the Boardwalk, extends between 5 meters at profile line 2 and 180 meters at profile line 1 with an overall average of 80 meters. The average berm elevation above MSL is 2.2 meters with a range beween 1.3 and 3.0 meters.

Winds are generally out of the southwest quadrant with mean speeds ranging from 20 to 45 kilometers per hour (Figs. 9, 10, and 11). The mean significant wave height is 0.81 meter with a mean wave period of 8.18 seconds consisting predominantly of plunging waves. The area also has a mean tidal range of 1.2 meters.

Among the largest natural changes measured between surveys at a single profile line were a volume loss of 51.39 cubic meters per meter during the

storm of 2 March 1969 at profile line 5 and a shoreline recession of 30.18 meters during the 25 February 1968 storm at profile line 7. Storm changes (Fig. 30) indicate no clear correlation between shoreline recession and erosion, as might be expected. For example, during the 2 March 1969 storm, the average shoreline accreted 6.99 meters, whereas the average above MSL unit volume eroded 11.01 cubic meters per meter. However, profile line 2 shows the most critical erosion, as shown in Figures 36, 37, and 38.

Major beach-fill projects were completed in 1963 and 1970, introducing approximately 428,000 and 635,000 cubic meters of fill material, respectively, to the northern end of the study area (see Fig. 31). These fills were reasonably successful in nourishing the beach, as shown in Figure 33.

Seasonal changes are indicated with a maximum volume of sand above MSL from May through October (Fig. 45). The net volume change above MSL along the beach, disregarding the 1970 beach fill, is near zero. Although the beach, as a whole, experienced a near zero net change during the period 1963-69, there was a shift of beach storage volume from the 1963 fill site on the northern end of the study area toward the southwest, along the beach (Fig. 33). This shift of beach volume was expected with time and resulted in an effective beach-fill project.

In conclusion, this study was extremely valuable for the quantitative determination of some of the shore processes taking place at Atlantic City as well as to indicate how such studies may be accomplished more effectively and efficiently in the future.

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APPENDIX A

PROFILE LINE DOCUMENTATION

The station description forms in this appendix provide a summary of all data needed to recover or reestablish a survey point.

The horizontal and vertical control was first established when Atlantic City was surveyed for the Storm Warning Program, the forerunner of the Beach Evaluation Program. Most of the bronze disks were placed on the profile lines in 1975; a few were placed in 1976. All survey work was done by the U.S. Army Engineer District, Philadelphia. The given elevations are referenced to sea level datum.

The data on these forms are subject to change due to the reestablishment of survey points, or the updating of culture shown. CERC should be contacted for any updating of these data.

COUNTRY	TYPE OF MARK	STATION	
U.S.A.	Standard Bronze Disk	BE-A Sta. 0+00	Profile line 1
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) ~~(M)~~
Atlantic City, NJ	BE-A 0+00	Corps of Engrs.	7.20
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'57.72"	74°24'36.57"		S.L.D. 1929
(NORTHING)~~(EASTING)~~ (FT) ~~(M)~~	(EASTING)~~(NORTHING)~~ (FT) ~~(M)~~	GRID AND ZONE	ESTABLISHED BY (AGENCY)
194 120	2 072 524	NJ Trans Merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			19 Nov 75

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

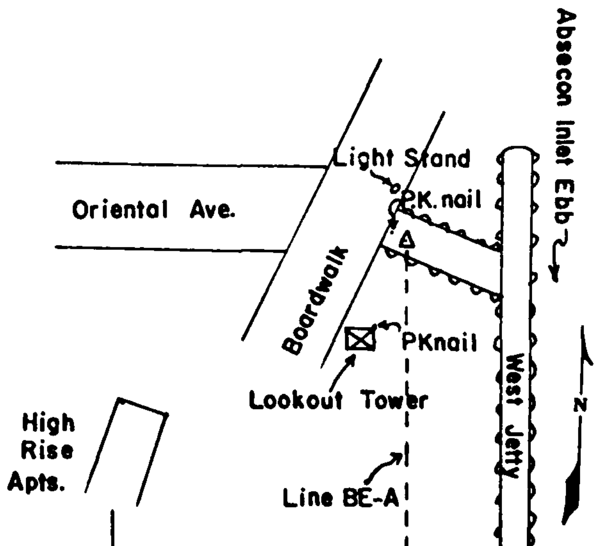
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

The station is located in Atlantic City, NJ at the east end of Oriental Avenue, and the north end of the west jetty of Absecon Inlet; 52.04 feet north of PK (elevation 7.58') nail in the lower end of diagonal brace under the NE corner of Coast Guard Lookout Tower; 11.69 feet east of NE corner of light stand on east side of boardwalk; 10.0 feet east of east side of boardwalk; 9.97 feet east of a PK nail in vertical side of the east stringer of boardwalk on centerline of Oriental Avenue extended; 3.0 feet north of centerline of stone groin, and 1.0 feet south of centerline Oriental Avenue extended.

The station is marked by a standard disk grouted into the top of stone groin.

NJ Grid Azimuth of Line BE-A 321°-30'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1958 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-B Sta. 0+10	Profile line 2
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT)
Atlantic City, NJ	BE-B 0+10	Corps of Engrs.	8.03
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'44.56"	74°24'46.26"		S.L.D. 1929
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
192 786	2 071 767	NJ Trans Merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			19 Nov 75

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

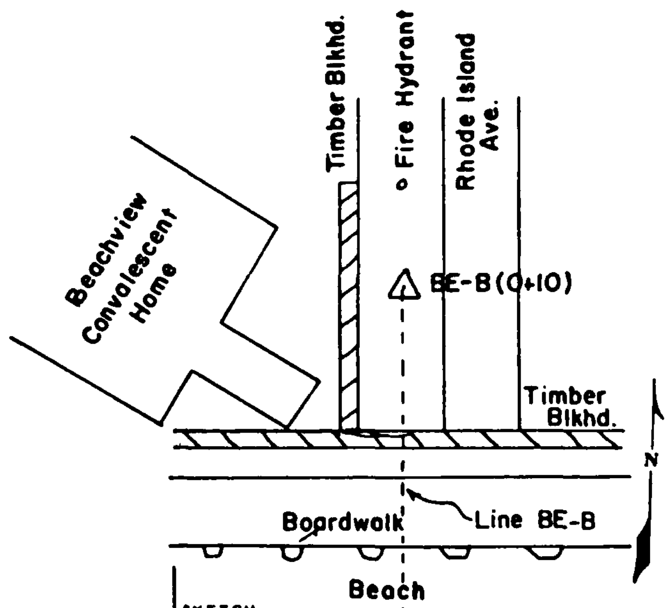
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID)(MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

The station is located in Atlantic City, NJ on the west sidewalk of Rhode Island Avenue; 130.40 feet north of a square cut in the top of concrete reinforcement on south side of boardwalk of Rhode Island Avenue (elevation 12.43'); 53.86 feet east of inner corner of Beachview convelescent home building; 48.5 feet north of a timber bulkhead at the ocean end of avenue; 39.97 feet NE of outer corner of Beachview convelescent home building; 10.00 feet south of top of fire hydrant and 1.5 feet west of the west curb of Rhode Island Avenue.

Station is marked by a standard disk grouted flush with sidewalk.

NJ Grid Azimuth of Line BE-B 332°-18'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-C Sta. (-)2+00 20' west Profile line 3	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT)
Atlantic City, NJ	BE-C -2+00 20'W	Corps of Engineers	7.85
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'36.91"	74°25'04.15"		S.L.D. 1929
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
192 008	2 070 364	NJ Trans Merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE: 19 Nov 75 / ORDER:

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

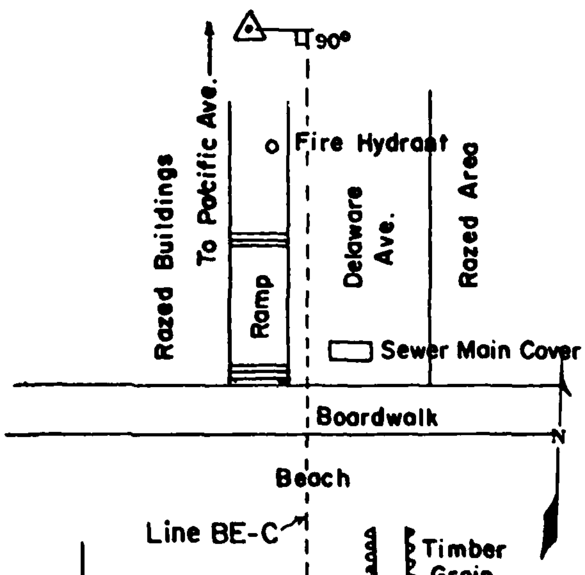
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID)(MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

The station is located in Atlantic City, NJ on the west side of Delaware Avenue in an area due for redevelopment; 45.23 feet north of south west corner of sewer main cover; 32.25 feet north of a fire hydrant; 4.92 feet west of a PK nail in the seam of west curb of Delaware Avenue.

Station is marked by a standard disk grouted flush into sidewalk, and is 20' west of profile line.

NJ Grid Azimuth of Line BE-C 333°-26'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE - D Sta. 0+00 Profile line 4	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) ~~(M)~~
Atlantic City, NJ	BE-D 0+00	Corps of Engrs.	10.71
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'27.78"	74°25'20.50"		S.L.D. 1929
(NORTHING)(~~EASTING~~) (FT) ~~(M)~~	(EASTING)(~~NORTHING~~) (FT) ~~(M)~~	GRID AND ZONE	ESTABLISHED BY (AGENCY)
191 081	2 069 082	NJ Trans merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			19 Nov 75

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

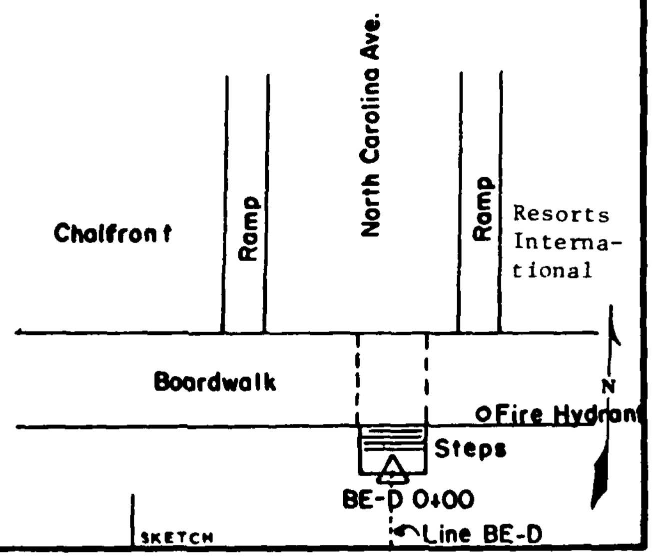
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID)(MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

Station is located in Atlantic City, NJ at the beach (south) end of North Carolina Avenue, under the boardwalk; 87.88 feet south east of the SE corner of Chalfont Building, 72.29 feet south west of SW corner of Resorts International; 29.52 feet southwest of the top center bolt of fire hydrant.

Station is marked by a standard disk grouted flush into the top step of a pedestrian ramp.

NJ Grid Azimuth of Line BE-D 332°-01'



SKETCH

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-E (-)2+75 20' west Profile line 5	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT) ~~(M)~~
Atlantic City, NJ	BE-E -2+75 20'W	Corps of Engrs.	6.56
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'22.90"	74°25'52.27"		S.L.D. 1929
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
190 580	2 066 588	NJ Trans Merc	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			24 Aug 76

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

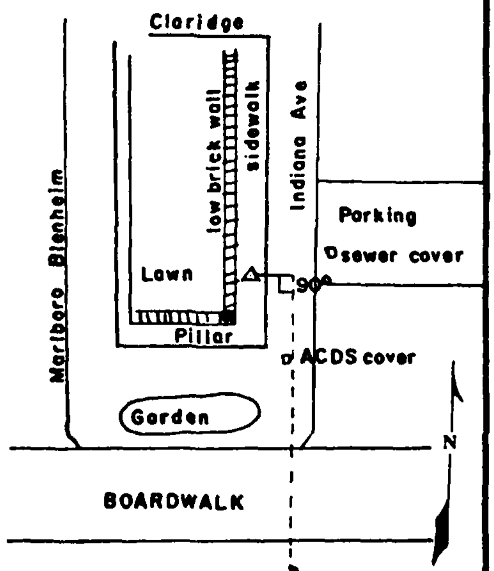
TO OBTAIN GRID AZ. (ADD)(SUB) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

Station is located in Atlantic City, NJ on the west side of Indiana Avenue, south of the Claridge Hotel, 49.60 feet west of the SE corner of sewer cover on the east side of Indiana Avenue; 18.79 feet north west of the NW corner of A.C.D.S. cover, just west of the centerline of street, and 12.85 feet north east of top center of pillar on NE side of steps leading to lawn.

Station is marked by a standard disk grouted flush into sidewalk, and is 20' west of profile line.

NJ Grid Azimuth of Line BE-E 332°-36'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is U.S. Continental Army Command.

COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-F Sta. (-) 0+75 Profile line 6	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT)
Atlantic City, NJ	BE-F -0+75	Corps of Engrs.	5.20
LATITUDE	LONGITUDE	DATUM	DATUM
39°21'08.93"	74°26'34.43"		S.L.D. 1929
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
189 159	2 063 280	NJ Trans Merc.	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			19 Nov 75

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

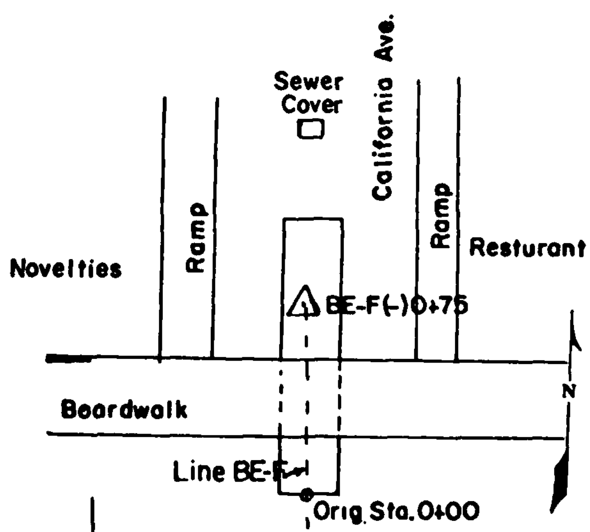
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

Station is located in Atlantic City, NJ under the boardwalk at the ocean, or south end of California Avenue, 49.38 feet south of the SE corner of sewer cover, just west of centerline of California Avenue, 12.0 feet SW of NE corner of east wall for ramp, 8.08 SE of the NW corner of west wall and 1.3 feet east of W. wall.

Station is marked by a standard disk grouted flush with surface of a pedestrain ramp.

NJ Grid Azimuth of Line BE-F 332°-55'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
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COUNTRY	TYPE OF MARK	STATION	
U. S. A.	Standard Bronze Disk	BE-G Sta. (-) 0+75 25.5' East Profile line 7	
LOCALITY	STAMPING ON MARK	AGENCY (CAST IN MARKS)	ELEVATION (FT)
Atlantic City, NJ	BE-G -0+75 25.5' E	Corps of Engrs.	11.64
LATITUDE	LONGITUDE	DATUM	DATUM
39°20'45.28"	74°27'34.82"		S.L.D. 1929
(NORTHING) (FT)	(EASTING) (FT)	GRID AND ZONE	ESTABLISHED BY (AGENCY)
186 754	2 058 542	NJ Trans Merc	Corps of Engineers
(NORTHING)(EASTING) (FT) (M)	(EASTING)(NORTHING) (FT) (M)	GRID AND ZONE	DATE / ORDER
			27 Aug 76

TO OBTAIN GRID AZIMUTH, ADD ° ' " TO THE GEODETIC AZIMUTH

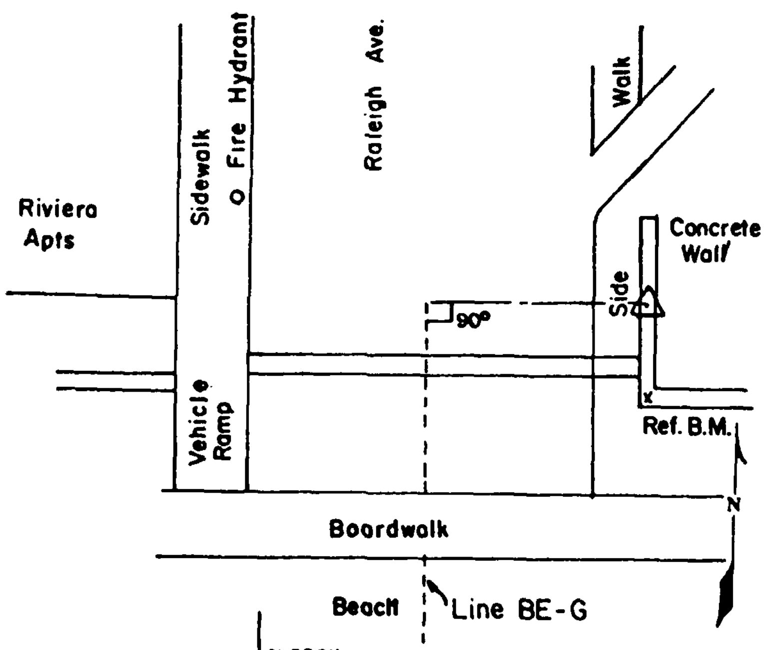
TO OBTAIN GRID AZ. (ADD)(SUB.) ° ' " TO THE GEODETIC AZIMUTH

OBJECT	AZIMUTH OR DIRECTION (GEODETIC)(GRID) (MAGNETIC)	BACK AZIMUTH	GEOD. DISTANCE (METERS) (FEET)	GRID DISTANCE (METERS) (FEET)
	° ' "	° ' "		

The station is located in Atlantic City, NJ on the east side of south (ocean) end of Raleigh Avenue; 52.59' south of north end of concrete wall; 44.31 feet southeast of fire hydrant; 38.20 feet north of reference B.M. which is a square cut in the southwest corner of concrete wall (elevation 11.52); and 11.0 feet east of east curb of Raleigh Avenue.

Station is marked by a standard disk grouted flush in concrete wall on east side of Raleigh Avenue, and is 25.5' east of profile line.

NJ Grid Azimuth of Line BE-G 328°-14'



SKETCH

DA FORM 1 OCT 64 1959 REPLACES DA FORMS 1959 AND 1960, 1 FEB 57, WHICH ARE OBSOLETE.

DESCRIPTION OR RECOVERY OF HORIZONTAL CONTROL STATION
For use of this form, see TM 5-237; the proponent agency is U.S.Continental Army Command.

APPENDIX B

PROFILE LINE SURVEY DATA

The survey data for the Atlantic City beach study are tabulated by profile line number and survey date (in the form YRMODA). Distances are in feet from the profile line bench mark; elevations are in feet above MSL.

DATE 621024
SRVY 1

TIME	1200
60.	4.4
121.	4.0
221.	3.9
321.	3.7
420.	3.7
508.	3.7
582.	0.6
640.	1.0
722.	-2.5

DATE 621101
SRVY 2

TIME	1200
20.	5.0
40.	4.7
79.	3.8
120.	3.9
170.	3.9
221.	3.9
271.	3.7
321.	3.6
370.	3.8
421.	3.8
520.	5.4
559.	6.3
610.	1.8
648.	-1.1
697.	-1.4
723.	-2.1

DATE 621109
SRVY 3

TIME	1200
29.	4.2
120.	4.0
224.	3.9
273.	3.8
321.	3.7
420.	3.7
521.	3.6
570.	2.9
654.	1.2
683.	.5
736.	-.6

DATE 621212
SRVY 4

TIME	1200
40.	4.0
105.	3.8
179.	4.0
261.	4.2
342.	4.4
418.	4.6
497.	4.3
574.	.8
673.	-2.0
728.	-3.5

DATE 630109
SRVY 5

TIME	1200
0.	7.1
15.	7.0
17.	4.5
50.	4.0
100.	3.8
150.	3.8
200.	3.8
250.	3.6
300.	4.4
350.	4.5
401.	4.4
450.	4.6
500.	5.6
526.	5.8
551.	3.1
582.	1.7
600.	1.2
625.	.5
650.	.1
676.	-1.3

DATE 630116
SRVY 6

TIME	1200
17.	4.5
50.	3.9
100.	3.4
125.	3.3
151.	3.4
200.	3.5
250.	3.7
300.	3.8
350.	3.9
401.	4.1
425.	4.2
436.	3.9
500.	5.3
519.	5.5
551.	2.8
601.	1.2
652.	-.3
674.	-1.0
701.	-1.4

DATE 630122
SRVY 7

TIME	1200
275.	4.2
300.	4.4
350.	4.6
400.	4.8
451.	4.5
500.	5.4
531.	5.6
551.	4.0
601.	1.5
674.	-1.2

DATE 630130
SRVY 8

TIME	1200
0.	7.1
16.	7.1
18.	4.5
50.	3.9
101.	3.5
151.	3.5
200.	3.8
250.	3.7
300.	3.8
350.	3.9
400.	4.0
451.	4.4
500.	5.3
516.	5.3
531.	4.8
551.	3.2
601.	1.0
651.	-.5
676.	-.9
701.	-1.1

DATE 630205
SRVY 9

TIME	1200
17.	4.8
50.	3.8
100.	3.4
150.	3.5
201.	3.8
251.	3.7
301.	3.7
351.	4.2
400.	4.2
451.	4.4
500.	5.3
520.	5.3
551.	4.1
575.	2.6
601.	1.1
651.	0.0
676.	-1.0

DATE 630213
SRVY 10

TIME	1200
50.	3.8
100.	3.3
151.	3.2
200.	3.3
250.	3.3
301.	3.7
350.	3.9
401.	3.9
451.	4.3
501.	5.1
525.	5.3
551.	4.5
601.	.9
651.	-.5
677.	-1.2

DATE 630221
SRVY 11

TIME	1200
-1.	7.1
15.	7.1
16.	6.1
50.	6.6
99.	7.9
150.	8.7
199.	9.0
250.	8.3
273.	7.4
300.	6.9
350.	6.4
400.	5.8
425.	5.3
450.	5.0
474.	4.9
500.	5.3
526.	5.0
600.	1.9
651.	.7
700.	-.7
785.	-1.4

DATE 630227
SRVY 12

TIME	1200
50.	6.6
99.	7.7
125.	8.6
150.	8.8
200.	8.7
225.	8.7
275.	7.6
300.	7.1
351.	6.4
400.	5.7
450.	5.0
500.	5.1
525.	5.0
550.	4.0
576.	3.4
600.	1.6
650.	1.1
676.	.5
700.	0.0
726.	-1.0

DATE 630307
SRVY 13

TIME	1200
326.	6.7
375.	5.9
401.	5.8
424.	5.3
450.	5.0
525.	5.0
550.	4.4
575.	3.3
600.	2.5
627.	1.7
650.	1.2
701.	0.0
726.	-.9
751.	-1.1

DATE 630313
SRVY 14

TIME	1200
0.	7.1
14.	7.0
16.	6.1
24.	6.5
45.	6.5
99.	7.7
150.	8.8
175.	8.8
200.	9.0
225.	8.8
250.	8.4
275.	7.7
300.	7.0
325.	6.8
351.	6.3
400.	5.8
424.	5.2
451.	4.9
474.	4.9
500.	5.0
526.	5.0
550.	4.7
575.	3.8
600.	2.7
624.	1.9
651.	1.2
700.	0.0
725.	-1.3

DATE 630321
SRVY 15

TIME	1200
16.	6.0
49.	6.5
99.	7.5
150.	8.5
175.	8.4
200.	9.0
225.	8.4
250.	8.3
300.	6.9
324.	6.7
350.	6.3
400.	5.8
425.	5.2
450.	4.9
500.	5.0
550.	4.6
574.	4.2
600.	3.0
651.	1.2
701.	0.0
725.	-.8
751.	-2.0

DATE 630402
SRVY 16

TIME	1200
150.	8.8
200.	9.1
225.	8.6
250.	8.8
275.	6.9
300.	7.4
325.	6.9
350.	6.8
400.	5.8
425.	5.7
450.	5.0
475.	5.2
525.	5.2
551.	4.4
576.	3.2
601.	2.2
651.	.5
675.	0.0
786.	-1.4

DATE	630523
SRVY	17
TIME	1200
10.	6.4
20.	6.6
70.	7.0
150.	9.3
200.	9.3
250.	8.6
300.	7.3
351.	6.9
400.	6.3
450.	5.9
500.	5.3
550.	5.3
601.	4.6
620.	4.1
651.	3.3
700.	1.3
752.	.8
801.	-1.0
820.	-2.8

DATE	630611
SRVY	18
TIME	1200
0.	7.1
12.	7.1
14.	6.9
50.	7.1
100.	7.9
150.	9.1
200.	9.2
250.	8.8
300.	7.4
350.	6.9
400.	6.2
450.	5.5
500.	5.4
551.	5.4
575.	5.2
601.	4.7
651.	2.9
701.	1.4
725.	.8
751.	.8
777.	0.0
820.	-1.0

DATE	630626
SRVY	19
TIME	1200
200.	9.2
250.	8.1
300.	7.0
350.	6.5
400.	5.8
451.	5.1
500.	5.4
526.	5.1
550.	5.2
600.	4.7
651.	2.6
679.	1.8
702.	.9
751.	0.0
801.	-1.1

DATE	630712
SRVY	20
TIME	1200
-1.	7.1
14.	7.0
15.	6.5
49.	6.6
100.	8.1
150.	9.0
200.	9.0
250.	8.5
300.	7.3
351.	6.7
400.	5.9
450.	5.3
500.	5.3
551.	5.3
601.	4.9
625.	4.3
651.	2.9
676.	1.9
701.	1.2
751.	-.2
776.	-.7

DATE	630724
SRVY	21
TIME	1200
50.	6.6
100.	7.8
150.	9.1
200.	9.2
224.	8.9
250.	8.6
300.	7.3
351.	6.5
400.	6.3
450.	5.9
500.	5.2
551.	5.3
601.	5.2
625.	5.4
701.	2.2
724.	1.8
751.	.9
777.	.7
851.	-.7

DATE	630807
SRVY	22
TIME	1200
0.	7.1
14.	7.1
15.	6.6
50.	6.5
99.	9.1
150.	8.8
200.	9.0
251.	8.8
300.	7.4
351.	6.7
400.	6.0
451.	5.8
501.	5.2
551.	5.3
601.	5.2
626.	5.1
679.	2.9
702.	1.8
752.	.4
801.	-.2
852.	-1.4

DATE	630823
SRVY	23
TIME	1200
0.	7.1
50.	6.3
99.	7.8
150.	9.1
200.	8.9
250.	8.5
300.	7.3
350.	6.7
402.	6.1
451.	5.2
502.	5.2
551.	5.2
576.	5.1
602.	5.3
627.	4.4
652.	4.5
676.	3.5
700.	1.5
727.	.9
752.	.6
776.	-.2
801.	-.7

DATE	630905
SRVY	24
TIME	1200
350.	6.7
400.	6.2
451.	5.3
500.	5.4
551.	5.4
601.	5.3
651.	5.0
701.	2.9
780.	1.9

DATE	630925
SRVY	25
TIME	1200
0.	7.2
14.	7.1
15.	6.6
25.	5.8
50.	7.6
101.	8.8
152.	9.3
202.	8.8
252.	6.9
302.	5.7
352.	5.0
454.	4.4
504.	4.0
554.	3.8
580.	3.8
600.	3.4
631.	3.0
681.	1.0
707.	.6
731.	0.0

DATE	631009
SRVY	26
TIME	1200
-60.	10.5
-25.	7.5
-1.	7.0
14.	7.0
15.	6.1
25.	5.9
50.	6.4
100.	8.0
151.	8.9
201.	9.0
252.	7.4
303.	5.9
353.	5.0
403.	4.4
454.	4.2
504.	3.9
530.	3.7
555.	3.7
605.	4.5
630.	2.3
656.	1.2
700.	0.0
731.	-.4
788.	-1.0

DATE	631028
SRVY	27
TIME	1200
201.	9.0
251.	8.2
301.	6.7
352.	5.8
403.	5.2
454.	4.8
504.	4.5
528.	4.5
554.	4.9
604.	5.3
655.	2.4
706.	.8
756.	0.0
779.	-.2
806.	-.8

DATE	631118
SRVY	28
TIME	1200
-61.	10.5
-25.	9.5
0.	6.9
13.	6.9
15.	6.0
25.	4.5
51.	4.8
101.	5.1
151.	5.1
202.	4.0
252.	3.6
302.	3.3
353.	3.4
403.	2.8
453.	2.6
504.	1.9
554.	1.2
655.	-1.3

DATE	631231
SRVY	29
TIME	1200
15.	6.2
50.	6.5
76.	6.8
101.	6.7
127.	6.0
151.	5.9
202.	4.9
227.	4.5
252.	4.5
281.	4.4
302.	4.1
352.	4.1
378.	4.0
403.	4.2
453.	4.2
503.	4.2
554.	4.0
580.	3.9
630.	2.7
655.	1.9
706.	1.0
731.	.7
756.	.1
806.	-1.6
831.	-2.1

DATE	640117
SRVY	30
TIME	1200
0.	7.0
10.	7.0
15.	5.7
21.	5.0
50.	5.6
101.	5.8
201.	4.5
252.	3.8
303.	3.5
353.	3.2
403.	3.0
453.	2.9
504.	2.8
555.	2.5
606.	2.1
655.	1.6
705.	1.2
756.	.6
831.	-1.4

DATE	640214
SRVY	31
TIME	1200
0.	7.0
21.	4.9
51.	5.6
101.	5.8
152.	7.2
202.	4.5
252.	4.1
302.	3.8
352.	3.5
403.	3.5
453.	3.4
504.	3.2
554.	3.0
604.	2.3
655.	1.8
706.	0.0
750.	-2.0
781.	-2.8

DATE	640312
SRVY	32
TIME	1200
0.	7.0
22.	5.4
50.	5.4
100.	5.0
150.	4.4
201.	4.0
251.	3.7
301.	3.6
352.	3.4
402.	3.3
453.	3.1
503.	3.0
553.	3.1
604.	2.2
654.	1.1
708.	-.1
788.	-2.6

DATE	640409
SRVY	33
TIME	1200
25.	5.1
50.	5.1
100.	4.5
150.	3.4
201.	2.9
251.	3.1
302.	3.1
351.	2.9
402.	2.6
452.	2.7
503.	2.9
553.	2.8
604.	2.1
654.	.8
705.	-.3
755.	-2.7
805.	-3.3

DATE	640527
SRVY	34
TIME	1200
25.	4.7
50.	4.9
100.	4.5
151.	3.8
201.	3.2
251.	2.8
302.	2.7
351.	2.9
402.	2.9
452.	2.8
503.	2.4
553.	3.8
604.	4.9
654.	3.7
704.	-.1
755.	-2.3
780.	-3.0

DATE	640624
SRVY	35
TIME	1200
0.	6.0
23.	5.1
50.	5.2
100.	4.6
151.	4.0
201.	3.4
251.	3.1
302.	3.0
352.	3.0
402.	3.0
452.	2.9
503.	2.7
553.	4.1
603.	5.3
634.	5.2
653.	4.2
705.	.7
754.	-1.2
805.	-2.4

DATE	640831
SRVY	36
TIME	1200
0.	6.8
24.	5.1
50.	4.9
101.	4.2
151.	3.7
201.	3.1
251.	2.9
301.	2.9
351.	2.9
402.	2.9
452.	2.7
502.	2.6
552.	4.1
602.	5.5
653.	4.7
704.	1.8
753.	.2
804.	-.8
830.	-1.1
855.	-1.9

DATE	640925
SRVY	37
TIME	1200
23.	5.1
49.	5.2
100.	6.5
150.	4.1
201.	3.5
251.	3.5
301.	3.5
351.	3.9
402.	4.3
452.	4.4
503.	4.6
553.	3.9
603.	1.9
653.	1.8
704.	.9

DATE	641203
SRVY	38
TIME	1200
8.	4.9
50.	5.2
100.	4.6
151.	4.0
201.	3.1
251.	3.1
301.	3.5
352.	3.7
402.	3.9
452.	4.1
502.	4.6
552.	4.7
603.	5.3
653.	1.9
703.	-.1
754.	-2.0
779.	-2.3

DATE	650120
SRVY	39
TIME	1200
25.	4.1
51.	4.2
101.	3.8
151.	3.4
202.	3.1
252.	2.9
302.	2.9
353.	2.8
403.	2.8
453.	2.8
503.	2.6
554.	2.1
604.	1.9
655.	1.8
705.	1.7
755.	1.3
800.	.3
850.	-1.6
881.	-2.2

DATE	650420
SRVY	40
TIME	1200
26.	4.9
51.	4.1
100.	3.8
151.	3.5
201.	3.1
252.	2.8
302.	2.8
353.	2.8
403.	2.9
453.	3.4
504.	3.9
554.	4.3
604.	5.8
705.	-.9
755.	-2.1
808.	-3.0

DATE	650908
SRVY	41
TIME	1200
25.	4.9
50.	4.5
100.	3.9
151.	3.5
201.	3.2
252.	2.8
302.	2.7
353.	2.4
403.	2.4
453.	2.7
503.	2.9
553.	3.3
604.	4.3
654.	4.8
705.	1.9
755.	.1
800.	-2.0
850.	-2.8

DATE	651020
SRVY	42
TIME	1200
0.	6.9
50.	4.7
101.	3.2
151.	2.9
202.	2.8
252.	2.9
302.	2.9
352.	3.1
403.	3.4
453.	3.6
503.	3.9
554.	4.1
604.	3.7
654.	3.9
704.	2.8
755.	.9
805.	-1.0

DATE	651220
SRVY	43
TIME	1200
25.	5.8
51.	4.0
100.	3.3
151.	2.7
201.	2.7
252.	2.9
302.	2.9
353.	2.9
403.	3.2
453.	3.4
503.	3.7
554.	3.7
604.	4.4
654.	4.2
687.	3.9
705.	.7
755.	-.9
805.	-2.5
856.	-3.2

DATE	660128
SRVY	44
TIME	1200
25.	4.4
50.	5.1
100.	4.5
151.	3.8
201.	3.4
252.	3.1
302.	3.2
352.	3.4
402.	3.5
452.	3.5
503.	3.3
553.	3.3
603.	3.0
654.	2.4
754.	.5
804.	-.5
880.	-1.9

DATE	660320
SRVY	45
TIME	1200
25.	4.5
50.	3.5
101.	3.1
151.	2.9
201.	2.9
251.	3.1
302.	3.2
352.	3.4
402.	3.8
452.	4.2
503.	4.1
553.	3.6
603.	3.9
653.	2.0
703.	.8
754.	-.3
855.	-3.7

DATE	660426
SRVY	46
TIME	1200
25.	5.0
50.	5.1
100.	4.3
150.	3.8
201.	3.4
252.	3.5
302.	3.4
352.	3.4
402.	3.7
453.	4.4
503.	5.1
553.	4.8
604.	4.8
654.	2.0
704.	.3
754.	-1.2
808.	-1.2

DATE	661103
SRVY	47
TIME	1200
20.	5.2
50.	4.8
101.	3.9
151.	3.6
202.	3.7
252.	3.4
302.	3.4
352.	3.5
402.	3.8
503.	3.2
553.	3.1
603.	4.4
653.	3.9
754.	-.3
804.	-1.8

DATE	670118
SRVY	48
TIME	1200
24.	5.0
50.	4.5
100.	3.6
151.	3.3
201.	3.3
252.	3.1
301.	2.9
352.	2.8
402.	2.7
453.	2.5
503.	2.4
553.	3.3
617.	3.5
654.	2.2
704.	.9
755.	-.8
805.	-2.1
850.	-3.3

DATE	670503
SRVY	49
TIME	1200
23.	4.0
50.	4.0
101.	3.3
151.	3.0
201.	3.0
252.	2.9
304.	2.6
353.	2.5
402.	2.0
453.	1.8
503.	1.9
553.	1.9
603.	2.4
654.	2.3
704.	1.8
755.	-.4
804.	-2.2
854.	-2.4

DATE	670915
SRVY	50
TIME	1200
23.	4.2
50.	3.9
100.	3.2
150.	2.8
200.	2.8
250.	2.7
300.	2.7
350.	2.4
400.	2.3
450.	2.2
500.	1.9
550.	1.9
600.	2.8
650.	3.8
701.	3.4
750.	1.9
801.	.1
850.	-1.0
900.	-1.8

DATE	670919
SRVY	51
TIME	1200
26.	4.0
50.	3.8
100.	2.8
191.	2.5
200.	2.4
250.	2.3
300.	2.3
350.	2.3
400.	2.0
450.	1.9
500.	1.9
550.	1.9
600.	1.4
651.	1.1
700.	1.5
751.	1.4
800.	.5
850.	-1.5
900.	-2.1

DATE	671213
SRVY	52
TIME	1200
24.	4.1
49.	3.8
100.	2.7
150.	2.7
200.	2.6
250.	2.6
300.	2.6
350.	2.5
400.	2.4
450.	2.6
500.	3.7
550.	4.1
600.	3.5
651.	2.1
700.	1.2
751.	.2
800.	-1.7
850.	-3.8

DATE	680115
SRVY	53
TIME	1200
24.	4.4
50.	4.1
100.	2.8
150.	2.7
200.	2.4
250.	2.4
300.	2.7
350.	3.3
400.	4.2
450.	4.3
500.	4.1
550.	3.8
600.	2.9
650.	2.1
699.	1.0
750.	0.0
799.	-1.7
849.	-2.8

DATE	680124
SRVY	54
TIME	1200
24.	4.4
50.	4.2
100.	2.8
150.	2.6
200.	2.5
250.	2.4
300.	2.8
350.	3.4
400.	3.9
450.	4.8
500.	4.7
549.	4.1
600.	3.3
649.	1.6
699.	.6
749.	-.9
799.	-2.3

DATE	680130
SRVY	55
TIME	1200
25.	4.4
50.	3.9
100.	2.6
150.	2.4
200.	2.2
250.	2.3
300.	2.4
350.	3.1
400.	3.5
450.	3.2
500.	3.8
550.	3.3
600.	3.1
650.	2.3
699.	1.1
750.	-.7
800.	-2.5

DATE	680200
SRVY	56
TIME	1200
0.	7.1
25.	4.0
50.	3.9
100.	2.6
150.	2.4
200.	2.5
250.	2.4
300.	2.8
350.	3.3
400.	3.6
450.	3.4
500.	3.0
550.	2.8
600.	2.2
650.	1.2
700.	.7
790.	0.0

DATE	680215
SRVY	57
TIME	1200
-1.	7.1
23.	3.8
55.	3.8
100.	2.4
150.	2.4
200.	2.4
250.	2.3
300.	2.3
350.	2.3
400.	3.0
450.	2.8
500.	2.6
550.	2.3
600.	2.3
651.	1.8
700.	1.7
750.	0.0
800.	-2.1
850.	-2.7
900.	-3.4

DATE	680221
SRVY	58
TIME	1200
-1.	7.1
24.	3.9
50.	3.8
100.	2.5
150.	2.6
199.	2.4
251.	2.4
300.	2.5
350.	2.6
400.	2.8
450.	2.8
500.	2.6
550.	2.6
600.	2.7
650.	2.3
699.	1.7
750.	.2
799.	-1.9
826.	-2.3

DATE	680226
SRVY	59
TIME	1200
0.	7.1
24.	3.9
50.	3.9
100.	2.6
150.	2.6
200.	2.4
250.	2.3
300.	2.5
351.	2.9
400.	3.0
450.	2.9
500.	2.7
550.	2.7
650.	3.6
700.	1.3
750.	-1.0
800.	-2.4
850.	-2.8
900.	-3.4

DATE	680307
SRVY	60
TIME	1200
0.	7.1
22.	4.0
50.	3.9
100.	2.5
150.	2.5
200.	2.5
251.	2.4
300.	2.7
350.	2.9
401.	2.9
450.	2.9
500.	3.0
550.	3.2
600.	2.8
650.	2.1
700.	1.0
750.	-.5
800.	-1.4
850.	-2.0

DATE	680313
SRVY	61
TIME	1200
0.	7.2
24.	3.1
50.	3.9
100.	2.9
150.	2.8
201.	2.5
251.	2.5
300.	2.8
350.	2.9
401.	2.9
450.	3.3
500.	3.9
550.	3.8
600.	3.1
649.	2.1
699.	1.0
750.	.1
800.	-1.3
850.	-2.8

DATE	680322
SRVY	62
TIME	1200
50.	3.9
100.	2.8
150.	2.7
200.	2.4
251.	2.5
300.	2.9
351.	2.9
401.	2.9
450.	2.9
500.	2.9
550.	2.9
600.	2.7
650.	2.1
699.	1.9
751.	.1
800.	-1.8
850.	-2.2
900.	-3.1

DATE	681007
SRVY	63
TIME	1200
23.	4.8
50.	3.9
100.	2.6
150.	2.6
200.	2.4
250.	2.5
300.	2.7
350.	2.7
400.	2.7
450.	2.8
500.	2.8
550.	3.0
600.	4.2
650.	5.5
675.	6.0
700.	2.9
750.	.4
800.	-.9
850.	-2.1
875.	-2.6

DATE	681025
SRVY	64
TIME	1200
5.	4.9
50.	3.8
100.	2.8
150.	2.5
200.	2.3
250.	2.4
300.	2.5
350.	2.7
400.	2.7
450.	3.0
500.	3.0
550.	3.6
600.	5.0
650.	6.5
700.	1.9
750.	.7
800.	-.7
825.	-1.4

DATE	681115
BRVY	65
TIME	1200
25.	4.1
50.	4.2
100.	3.3
150.	3.1
200.	3.0
250.	3.1
300.	3.2
350.	3.5
400.	3.7
450.	3.8
500.	3.7
550.	3.2
600.	2.6
650.	1.8
700.	.8
750.	.4
800.	-.1
850.	-1.6
900.	-3.8

DATE	681220
BRVY	66
TIME	1200
25.	4.4
50.	4.0
100.	3.0
150.	2.8
200.	2.7
250.	2.8
300.	2.8
350.	3.1
400.	3.3
450.	3.7
500.	3.6
550.	3.7
600.	3.2
650.	2.6
700.	1.2
750.	0.0
800.	-1.2
850.	-3.0

DATE	690113
BRVY	67
TIME	1200
0.	7.2
25.	4.4
50.	4.0
100.	3.0
150.	2.8
200.	2.9
250.	2.7
300.	2.8
350.	3.2
400.	3.5
450.	3.7
500.	4.1
550.	4.0
600.	3.4
650.	2.4
670.	2.5
700.	.8
750.	-1.6
800.	-3.3

DATE	690122
BRVY	68
TIME	1200
0.	7.2
25.	3.9
50.	4.0
100.	2.9
150.	2.7
200.	2.8
250.	2.7
300.	2.8
350.	3.1
400.	3.4
450.	4.1
500.	4.4
550.	3.9
600.	2.9
650.	2.0
700.	.7
750.	-.8
800.	-1.7

DATE	690129
BRVY	69
TIME	1200
0.	7.2
25.	4.3
50.	4.1
100.	3.0
150.	2.7
200.	2.8
250.	2.9
300.	2.9
350.	3.4
400.	4.0
450.	4.5
500.	4.6
550.	4.2
600.	3.0
650.	2.2
670.	2.0
700.	1.0
750.	-.8
800.	-2.3
825.	-2.9

DATE	690205
BRVY	70
TIME	1200
0.	7.2
25.	4.1
50.	3.8
100.	2.9
150.	2.8
200.	2.9
250.	2.9
300.	2.9
350.	3.5
400.	4.0
450.	4.5
500.	4.8
550.	4.1
600.	4.0
650.	2.5
700.	.5
750.	-1.8
800.	-2.9
850.	-2.0
900.	-3.4

DATE	690212
BRVY	71
TIME	1200
25.	3.9
50.	3.8
100.	2.9
150.	2.7
200.	2.7
250.	2.8
300.	2.9
350.	3.2
400.	3.6
450.	3.9
500.	4.0
550.	3.8
600.	3.7
637.	3.8
650.	2.0
700.	.1
750.	-2.1
800.	-2.0
850.	-2.2
900.	-3.0

DATE	690219
BRVY	72
TIME	1200
0.	7.2
25.	3.7
50.	3.8
100.	3.0
150.	2.7
200.	2.8
250.	2.9
300.	3.0
350.	3.5
400.	3.5
450.	3.7
500.	3.9
550.	3.7
600.	3.3
650.	2.4
675.	1.7
700.	.9
750.	-.6
800.	-1.5
850.	-2.0
900.	-2.9

DATE	690226
BRVY	73
TIME	1200
0.	7.2
25.	3.8
50.	3.6
100.	2.9
150.	2.8
200.	2.8
250.	3.1
300.	3.4
350.	3.6
400.	3.6
450.	3.6
500.	3.6
550.	3.7
600.	3.1
650.	2.0
700.	.9
750.	-.2
800.	-.8
850.	-1.5
900.	-2.5

DATE	690305
BRVY	74
TIME	1200
0.	7.2
25.	3.3
50.	3.6
100.	2.8
150.	2.8
200.	3.0
250.	3.1
300.	3.2
350.	3.1
400.	3.0
450.	2.8
500.	2.2
550.	1.9
600.	1.9
650.	1.4
700.	1.3
750.	.8
800.	.1
850.	-1.5
900.	-3.3
950.	-5.2

DATE	690312
BRVY	75
TIME	1200
0.	7.2
25.	3.3
50.	3.5
100.	2.8
150.	2.8
200.	3.1
250.	3.2
300.	3.2
350.	3.2
400.	3.0
450.	2.8
500.	2.4
550.	2.3
600.	2.4
650.	2.4
700.	2.2
750.	0.0
800.	-1.8
850.	-3.4

DATE	690319
BRVY	76
TIME	1200
0.	7.2
25.	3.3
50.	3.3
100.	2.5
150.	2.7
200.	2.9
250.	2.9
300.	3.1
350.	3.1
400.	2.9
450.	2.8
500.	2.4
550.	2.3
600.	2.4
650.	3.3
700.	2.1
750.	.2
800.	-1.6
850.	-3.2

DATE	690527
BRVY	77
TIME	1200
0.	7.2
50.	3.4
100.	2.5
150.	2.5
200.	2.5
250.	2.5
300.	2.4
350.	2.2
400.	1.8
450.	2.4
500.	3.0
550.	3.5
600.	4.2
650.	5.6
700.	.9
750.	-1.3
800.	-2.2
850.	-3.6

DATE	690923
BRVY	78
TIME	1200
50.	3.9
100.	2.5
150.	2.5
200.	2.7
250.	2.5
300.	2.7
350.	2.6
400.	2.6
450.	2.3
500.	3.2
550.	3.6
600.	5.0
650.	6.3
700.	2.5
750.	1.2
800.	-.4

DATE	691023
BRVY	79
TIME	1200
0.	7.2
25.	4.4
50.	3.9
100.	2.8
150.	2.9
200.	3.1
250.	3.2
300.	3.2
350.	3.2
400.	2.9
450.	2.9
500.	3.2
550.	4.4
600.	4.4
623.	4.6
650.	3.2
700.	1.3
750.	-.1
800.	-1.8
850.	-3.5
900.	-3.7
950.	-5.4

DATE	691120
BRVY	80
TIME	1200
0.	7.2
25.	4.2
50.	3.6
100.	2.7
150.	2.9
200.	2.9
250.	3.0
300.	3.1
350.	3.0
400.	3.0
450.	3.2
500.	3.1
550.	3.5
600.	3.8
650.	2.8
700.	1.1
750.	-.5
800.	-1.9
850.	-3.2

DATE	691216
BRVY	81
TIME	1200
0.	7.2
25.	4.1
50.	3.7
100.	2.9
150.	2.9
200.	2.9
250.	3.1
300.	3.0
350.	3.1
400.	4.2
450.	5.0
500.	5.1
550.	4.7
600.	3.7
650.	2.8
700.	1.0
750.	-.8
800.	-2.0
850.	-2.4
900.	-3.7

DATE	700114
BRVY	82
TIME	1200
0.	7.2
25.	4.1
50.	3.9
100.	3.1
150.	3.0
200.	3.2
250.	3.2
300.	3.2
350.	3.1
400.	3.3
450.	3.4
500.	3.2
550.	3.2
600.	2.9
650.	2.6
675.	2.4
700.	1.8
750.	-.1
761.	-.6
800.	-1.0
850.	-2.2
900.	-4.0

DATE	700121
BRVY	83
TIME	1200
0.	7.2
25.	4.1
50.	3.9
100.	3.0
150.	3.0
200.	3.0
250.	3.1
300.	3.1
350.	3.0
400.	3.3
450.	3.4
500.	3.3
550.	3.3
600.	3.3
650.	3.2
700.	1.7
750.	.1
800.	-1.1
850.	-2.1
900.	-3.4

DATE	700128
BRVY	84
TIME	1200
0.	7.2
25.	4.1
50.	3.7
100.	2.9
150.	2.8
200.	2.8
250.	2.9
300.	3.0
350.	2.9
400.	3.2
450.	3.3
500.	3.0
550.	3.6
600.	3.9
624.	3.7
650.	2.7
700.	.6
750.	-.9
800.	-2.1
850.	-2.6

DATE	700204
BRVY	85
TIME	1200
0.	7.2
25.	4.1
50.	3.7
100.	2.8
150.	2.8
200.	2.8
250.	2.8
300.	3.1
350.	3.8
400.	4.5
450.	4.8
500.	5.1
550.	4.1
600.	2.9
650.	.4
700.	0.0
750.	-1.3
800.	-1.8
850.	-2.6

DATE	700211
BRVY	86
TIME	1200
0.	7.2
25.	4.3
50.	3.7
100.	2.9
150.	2.9
200.	2.8
250.	3.0
300.	3.3
350.	4.1
400.	4.7
450.	5.1
500.	5.2
550.	4.5
600.	3.0
650.	1.4
700.	0.0
750.	-1.3
790.	-2.0

DATE	700218
BRVY	87
TIME	1200
0.	7.2
25.	4.4
50.	3.7
100.	2.8
150.	2.8
200.	2.8
250.	2.8
300.	3.1
350.	3.8
400.	4.5
450.	4.8
500.	4.9
550.	4.8
600.	3.5
650.	2.5
700.	1.2
750.	-.4
800.	-1.9
850.	-2.1

DATE	700225
BRVY	88
TIME	1200
25.	4.2
50.	3.5
100.	2.6
150.	2.7
200.	2.8
250.	2.9
300.	3.2
350.	3.9
400.	4.5
450.	5.0
500.	5.4
550.	5.0
600.	3.6
650.	2.0
700.	.7
750.	-1.5
800.	-2.4

DATE	700304
BRVY	89
TIME	1200
25.	4.3
50.	3.6
100.	2.8
150.	2.8
200.	2.8
250.	2.9
300.	3.1
350.	4.0
400.	5.0
450.	5.0
500.	5.4
550.	5.0
567.	5.4
578.	4.0
600.	4.4
622.	4.7
650.	1.6
700.	-.4
750.	-1.8
800.	-2.5

DATE	700311
BRVY	90
TIME	1200
25.	4.2
50.	3.5
100.	2.8
150.	2.8
200.	2.9
250.	3.0
300.	3.0
350.	3.8
400.	4.5
450.	4.8
500.	5.1
550.	4.8
600.	5.6
650.	2.0
700.	-.4
750.	-1.6
800.	-1.8
850.	0.0
900.	0.0

DATE	700318
BRVY	91
TIME	1200
25.	4.3
50.	3.4
100.	2.8
150.	2.8
200.	2.8
250.	3.0
300.	3.2
350.	4.0
400.	4.7
450.	5.1
500.	5.3
550.	5.1
600.	5.5
671.	-.1
700.	-.5
750.	-1.4
800.	-1.7
850.	-2.0
900.	-4.1

DATE	700518
BRVY	92
TIME	1200
25.	4.3
50.	3.7
75.	2.9
100.	2.6
150.	2.6
200.	2.7
250.	3.0
300.	3.5
350.	4.1
400.	4.3
450.	4.8
500.	5.2
560.	4.9
571.	4.6
600.	5.1
630.	6.1
680.	.1
708.	-2.1
740.	-2.9

DATE	700826
BRVY	93
TIME	1200
0.	7.2
25.	7.4
50.	8.6
100.	8.9
150.	8.7
200.	8.3
250.	7.5
300.	6.3
350.	5.8
400.	5.4
450.	5.0
500.	4.8
550.	4.9
600.	6.0
626.	6.7
647.	5.0
700.	3.4
750.	2.3
800.	1.1
850.	-.3
900.	-1.1
950.	-1.5
1009.	-3.0

DATE	701015
BRVY	94
TIME	1200
25.	7.8
50.	8.4
100.	8.9
150.	8.5
200.	8.1
250.	7.4
300.	6.2
350.	5.7
400.	5.3
450.	5.0
500.	4.7
550.	4.8
600.	5.9
628.	6.5
650.	4.9
700.	5.2
725.	5.6
750.	2.8
800.	.9
850.	-.1
900.	-1.0
950.	-2.4
1000.	-3.8

DATE	701106
BRVY	95
TIME	1200
0.	9.2
25.	6.4
50.	8.1
100.	9.1
150.	8.8
182.	8.4
200.	7.4
250.	5.7
300.	6.1
350.	4.8
400.	4.6
450.	4.4
500.	4.2
550.	3.9
600.	4.1
650.	3.9
700.	3.1
750.	2.1
800.	1.1
850.	-.8
900.	-2.4

DATE	701209
BRVY	96
TIME	1200
25.	5.5
50.	6.0
100.	6.3
150.	5.7
200.	5.2
250.	5.1
300.	4.2
350.	3.8
400.	3.6
450.	3.2
500.	3.0
550.	2.4
600.	2.4
650.	2.5
700.	4.0
750.	2.2
800.	.7
850.	-1.2

DATE	701210
SRVY	97
TIME	1200
0.	7.2
25.	6.1
50.	6.6
100.	7.2
150.	6.5
200.	5.8
250.	5.3
300.	5.1
350.	5.0
400.	4.9
450.	4.8
500.	4.7
550.	4.6
600.	4.2
650.	3.6
700.	2.9
750.	1.7
800.	.5
850.	-.7
875.	-1.3

DATE	710113
SRVY	98
TIME	1200
25.	5.0
50.	5.9
100.	6.0
150.	5.2
200.	4.9
250.	4.7
300.	4.3
350.	4.2
400.	4.0
450.	3.7
500.	3.5
550.	3.2
600.	2.7
650.	3.0
700.	2.1
750.	2.0
800.	.7
850.	-1.2
900.	-2.6

DATE	710209
SRVY	99
TIME	1200
25.	5.2
50.	6.0
100.	6.4
150.	5.6
200.	5.2
250.	4.8
300.	4.5
350.	4.2
400.	3.9
450.	3.9
500.	4.3
550.	4.4
600.	4.1
650.	3.1
700.	1.8
750.	.3
800.	-1.1
850.	-2.2

DATE	710311
SRVY	100
TIME	1200
25.	4.9
50.	5.7
100.	6.0
150.	5.4
200.	4.7
250.	4.2
300.	4.0
350.	3.7
400.	3.5
450.	3.4
500.	3.1
550.	2.9
600.	2.8
650.	2.8
700.	2.0
750.	1.0
800.	-.5
850.	-1.6

DATE	710412
SRVY	101
TIME	1200
25.	5.0
50.	5.1
100.	4.5
150.	4.1
200.	3.9
250.	3.6
300.	3.6
350.	3.4
400.	3.4
450.	3.5
500.	3.4
550.	3.1
600.	2.6
650.	2.4
700.	1.9
750.	.6
800.	-1.3
850.	-3.0

DATE	710607
SRVY	102
TIME	1200
25.	5.2
50.	5.2
100.	4.8
150.	4.5
200.	4.1
250.	3.9
300.	3.8
350.	3.6
400.	3.3
450.	3.4
500.	3.4
550.	3.5
600.	4.6
650.	6.0
700.	2.6
720.	.7
750.	-.1
800.	-1.6
850.	-2.4

DATE	710810
SRVY	103
TIME	1200
25.	5.2
50.	5.1
100.	4.3
150.	3.9
200.	3.8
250.	3.7
300.	3.7
350.	3.5
400.	3.5
450.	3.7
500.	3.7
550.	3.9
600.	5.1
650.	6.5
672.	6.7
700.	2.2
750.	-1.3

DATE	711004
SRVY	104
TIME	1200
25.	4.9
50.	5.2
100.	4.5
150.	4.0
200.	3.8
250.	3.7
300.	3.6
350.	3.5
400.	3.5
450.	3.4
500.	3.6
550.	3.5
600.	3.1
650.	2.7
700.	2.3
750.	1.7
800.	-.9
850.	-3.4

DATE	711213
SRVY	105
TIME	1200
25.	4.7
50.	5.1
100.	4.4
150.	4.1
200.	4.1
250.	3.9
300.	3.8
350.	3.7
400.	3.5
450.	3.7
500.	3.5
550.	3.2
600.	4.5
650.	4.3
680.	3.7
700.	2.4
750.	.7
800.	-.8
850.	-2.2

DATE	720110
SRVY	106
TIME	1800
25.	4.6
50.	4.8
100.	4.1
150.	4.0
200.	4.0
250.	5.8
300.	3.8
350.	3.8
400.	3.8
450.	3.8
500.	3.7
550.	4.2
600.	5.3
640.	6.1
700.	.9
740.	-1.8

DATE	720214
SRVY	107
TIME	1200
25.	5.0
50.	4.8
100.	4.2
150.	4.0
200.	4.1
250.	4.1
300.	4.0
350.	4.1
400.	4.8
450.	5.1
500.	5.2
550.	4.8
600.	4.0
650.	2.1
700.	.9
750.	-.6
800.	-2.5

DATE	720222
SRVY	108
TIME	1200
25.	3.7
50.	4.3
100.	4.3
150.	4.0
200.	3.9
250.	3.9
300.	3.9
350.	3.9
400.	3.7
450.	3.2
500.	2.9
550.	2.5
600.	2.2
650.	1.8
700.	1.3
750.	.7
800.	-.4
850.	-1.8

DATE	720317
SRVY	109
TIME	1200
25.	4.0
50.	4.4
100.	4.0
150.	3.9
200.	3.5
250.	3.5
300.	3.7
350.	3.7
400.	3.6
450.	3.5
500.	3.6
550.	3.7
600.	3.1
650.	2.3
700.	1.5
750.	-.2
800.	-2.7

DATE	720410
SRVY	110
TIME	1800
25.	4.6
50.	4.5
100.	4.2
150.	3.9
200.	3.9
250.	3.9
300.	3.9
350.	3.9
400.	4.1
450.	4.3
500.	4.4
550.	4.8
576.	5.5
600.	4.1
620.	4.1
650.	1.6
700.	-1.4
725.	-2.2

DATE	720821
SRVY	111
TIME	1300
25.	4.6
50.	4.5
100.	3.8
150.	3.8
200.	3.8
250.	3.8
300.	3.8
350.	3.7
400.	3.7
450.	3.6
500.	3.5
550.	3.8
600.	5.2
650.	7.0
660.	7.0
700.	3.2
750.	-.3
800.	-2.0

DATE	721020
SRVY	112
TIME	1000
25.	4.0
50.	4.1
100.	3.3
150.	3.4
200.	3.5
250.	3.5
300.	3.6
350.	3.7
400.	3.6
450.	3.8
500.	3.8
550.	3.9
600.	3.7
650.	3.3
700.	2.9
750.	1.2
800.	-.5

DATE	721208
SRVY	113
TIME	1300
25.	4.3
50.	3.7
100.	3.2
150.	3.2
200.	3.4
250.	3.4
300.	3.4
350.	3.5
400.	3.4
450.	3.5
500.	5.2
550.	5.8
600.	5.4
619.	5.8
650.	1.3
690.	-1.6

DATE	730105
SRVY	114
TIME	1000
25.	3.5
50.	3.9
100.	3.5
150.	3.2
200.	3.2
250.	3.1
300.	3.3
350.	3.4
400.	3.4
450.	3.4
500.	3.4
550.	4.4
595.	4.7
600.	4.5
650.	2.3
700.	-.3
725.	-1.3

DATE	730216
SRVY	115
TIME	1000
25.	3.5
50.	3.5
100.	3.0
150.	3.0
200.	3.0
250.	3.0
300.	3.1
350.	3.1
400.	2.9
450.	2.8
500.	2.9
550.	2.6
600.	2.1
650.	1.7
700.	.8
750.	-.3
800.	-1.4

DATE	730310
SRVY	116
TIME	900
25.	3.7
50.	3.2
100.	2.8
150.	2.9
200.	3.0
250.	3.1
300.	3.2
350.	3.2
400.	3.2
450.	3.4
500.	3.7
550.	3.8
600.	3.3
650.	1.8
700.	.1
750.	-.3
800.	-1.0
850.	-2.0

DATE	730324
SRVY	117
TIME	700
25.	3.2
50.	3.1
100.	2.5
150.	2.4
200.	2.4
250.	2.3
300.	2.2
350.	2.2
400.	2.3
450.	2.1
500.	1.7
550.	1.3
600.	1.0
650.	1.2
700.	1.1
750.	.6
800.	-.6

DATE	730405
SRVY	118
TIME	1200
25.	3.2
50.	3.1
100.	2.5
150.	2.5
200.	2.5
250.	2.4
300.	2.3
350.	2.5
400.	2.6
450.	2.4
472.	2.3
500.	4.0
550.	4.3
600.	3.5
650.	2.1
700.	.5
750.	-.7
800.	-1.5
825.	-1.8
850.	-2.0

DATE	730418
SRVY	119
TIME	1100
25.	3.5
50.	3.2
100.	2.4
150.	2.4
200.	2.3
250.	2.2
300.	2.3
350.	2.2
400.	2.2
450.	2.2
500.	2.2
550.	2.4
600.	2.9
650.	2.5
700.	1.8
750.	.5
800.	-.5
850.	-1.0

DATE	621024
SRVY	1
TIME	1200
66.	7.3
82.	6.7
144.	2.6
191.	.5
232.	-.7
291.	-1.2

DATE	621101
SRVY	2
TIME	1200
65.	7.1
83.	5.7
143.	1.8
194.	.1
223.	-1.3
251.	-2.0

DATE	621109
SRVY	3
TIME	1200
65.	6.1
111.	3.3
145.	1.2
209.	.4
262.	-.7
316.	-2.3

DATE	621212
SRVY	4
TIME	1200
71.	5.3
82.	4.7
111.	1.0
184.	.4
203.	-2.3
231.	-3.3

DATE	630109
SRVY	5
TIME	1200
65.	5.9
75.	3.3
100.	2.3
125.	1.0
150.	.6
177.	-.1
228.	-1.1

DATE	630116
SRVY	6
TIME	1200
65.	5.8
74.	4.6
100.	3.3
125.	2.2
149.	.2
173.	-.5
201.	-.6
228.	-1.1

DATE	630122
SRVY	7
TIME	1200
65.	5.9
80.	4.6
100.	3.7
125.	2.3
150.	.8
175.	0.0
220.	-2.1

DATE	630130
SRVY	8
TIME	1200
64.	5.8
74.	4.8
100.	3.5
125.	2.4
150.	.8
200.	-.5
225.	-1.0

DATE	630205
SRVY	9
TIME	1200
----	------
65.	5.8
99.	3.0
151.	1.0
200.	-.8
225.	-.9

DATE	630213
SRVY	10
TIME	1200
----	------
64.	6.1
100.	4.3
125.	2.3
151.	.9
182.	0.0
225.	-1.2

DATE	630221
SRVY	11
TIME	1200
----	------
65.	5.0
99.	3.6
150.	1.2
184.	0.0
225.	-1.1

DATE	630227
SRVY	12
TIME	1200
----	------
74.	5.2
100.	4.3
125.	1.9
175.	0.0
200.	-.6
225.	-1.1

DATE	630307
SRVY	13
TIME	1200
----	------
75.	5.1
100.	4.5
150.	3.3
200.	2.3
250.	.8
300.	-.8
325.	-1.4

DATE	630313
SRVY	14
TIME	1200
----	------
64.	5.7
75.	5.0
100.	5.4
125.	4.7
150.	4.7
174.	4.4
200.	3.0
250.	1.4
300.	.5
333.	-.1
376.	-1.1

DATE	630321
SRVY	15
TIME	1200
----	------
65.	6.8
149.	6.7
175.	8.0
250.	6.0
275.	6.0
320.	7.2
350.	6.0
359.	5.9
360.	5.5
400.	4.0
451.	2.0
475.	1.7
500.	-.5
526.	-1.5

DATE	630402
SRVY	16
TIME	1200
----	------
66.	7.0
77.	7.1
149.	8.5
175.	8.5
200.	8.9
220.	9.6
250.	9.5
300.	7.7
325.	8.4
350.	4.4
380.	6.9
384.	5.2
400.	3.2
425.	1.4
450.	.3
476.	0.0
526.	-1.4

DATE	630523
SRVY	17
TIME	1200
----	------
65.	7.1
100.	8.0
150.	8.8
200.	8.8
225.	9.8
250.	9.9
276.	8.5
300.	7.9
323.	8.1
350.	7.9
352.	5.1
376.	2.8
421.	.9
451.	-.1
476.	-.9

DATE	630611
SRVY	18
TIME	1200
----	------
69.	7.3
99.	7.9
150.	8.8
199.	8.8
224.	9.3
249.	9.3
277.	8.6
301.	7.7
323.	6.0
374.	2.5
401.	1.7
448.	0.6
476.	-.9

DATE	630626
SRVY	19
TIME	1200
----	------
277.	8.6
300.	7.8
325.	5.8
351.	3.2
375.	1.3
400.	.5
420.	0.0
451.	-.8

DATE	630712
SRVY	20
TIME	1200
----	------
64.	7.4
100.	7.9
142.	8.6
150.	8.5
177.	8.6
200.	8.8
225.	9.3
250.	9.0
276.	8.6
301.	7.9
327.	5.5
350.	5.1
376.	.8
401.	-.1
426.	-.7

DATE	630724
SRVY	21
TIME	1200
----	------
140.	8.5
150.	8.8
187.	8.7
225.	9.3
251.	9.1
276.	8.5
299.	7.8
326.	5.9
350.	3.5
375.	2.0
400.	.8
450.	-.2
476.	-1.0

DATE	630807
SRVY	22
TIME	1200
----	------
65.	7.4
100.	8.0
141.	8.5
180.	8.6
203.	8.8
226.	9.4
251.	9.0
276.	8.3
300.	7.2
326.	5.5
351.	4.3
375.	2.3
426.	1.2
451.	-.7

DATE	630823
SRVY	23
TIME	1200
----	------
141.	8.5
150.	8.8
201.	8.8
226.	9.4
251.	9.3
301.	8.1
325.	6.6
351.	4.3
376.	2.2
401.	.9
451.	-.7

DATE	630905
SRVY	24
TIME	1200
----	------
300.	8.1
304.	5.9
325.	3.4
351.	2.4

DATE	630925
SRVY	25
TIME	1200
100.	7.8
151.	9.0
175.	8.6
201.	8.8
227.	9.3
240.	8.9
265.	5.8
252.	4.9
277.	3.0
303.	1.8
328.	.3
353.	-.1

DATE	631009
SRVY	26
TIME	1200
-101.	7.6
-51.	7.6
0.	7.5
60.	8.4
63.	7.2
101.	7.9
144.	8.6
151.	9.0
177.	8.6
202.	8.8
226.	9.3
234.	8.9
252.	5.3
303.	1.5
328.	.8
352.	-.2
379.	-.6

DATE	631028
SRVY	27
TIME	1200
143.	8.7
151.	9.4
176.	8.6
201.	8.8
233.	9.4
238.	5.7
276.	8.5
302.	.7
330.	-1.1

DATE	631114
SRVY	28
TIME	1200
-101.	7.6
-51.	7.6
0.	7.5
60.	8.4
63.	7.3
143.	8.6
151.	8.6
177.	5.8
203.	3.9
252.	.5
276.	-.5
328.	-.8

DATE	631231
SRVY	29
TIME	1200
143.	8.6
151.	8.1
176.	7.3
202.	5.5
228.	4.0
252.	3.1
277.	2.7
302.	.8
326.	-.2
353.	-1.1
375.	-1.6
403.	-2.4

DATE	640117
SRVY	30
TIME	1200
-102.	7.6
-51.	7.5
-1.	7.5
59.	8.4
62.	7.4
125.	8.5
140.	8.8
147.	9.4
151.	7.4
201.	3.5
252.	1.6
303.	.3
352.	-3.0

DATE	640214
SRVY	31
TIME	1200
147.	9.5
150.	7.8
201.	4.1
252.	1.7
302.	-.4
353.	-2.7

DATE	640318
SRVY	32
TIME	1200
150.	8.5
176.	6.8
202.	5.5
227.	4.0
252.	1.8
279.	.1
304.	-1.7
321.	-2.1

DATE	640409
SRVY	33
TIME	1200
150.	6.5
176.	6.3
227.	3.9
277.	.2
327.	-3.0
352.	-2.8
377.	-2.6
453.	-2.6
478.	-2.8

DATE	640527
SRVY	34
TIME	1200
135.	8.6
144.	8.6
177.	7.0
201.	6.1
213.	5.7
220.	3.7
252.	1.3
277.	0.0
302.	-1.0
327.	-2.8

DATE	640624
SRVY	35
TIME	1200
141.	9.5
147.	7.7
191.	6.9
232.	3.2
271.	.5
301.	-.8
340.	-2.0

DATE	640831
SRVY	36
TIME	1200
63.	7.4
140.	8.9
165.	7.6
191.	6.8
221.	4.6
241.	2.7
267.	.7
302.	-.6
318.	-1.1
342.	-1.5

DATE	640925
SRVY	37
TIME	1200
-101.	7.5
-50.	7.5
0.	7.6
59.	8.4
63.	7.5
100.	6.0
141.	4.4
151.	3.3
161.	2.6
182.	1.9
191.	.9
201.	.8
220.	0.0

DATE	641203
SRVY	38
TIME	1200
141.	5.4
176.	4.7
201.	2.5
226.	1.3
252.	0.0
277.	-.6
302.	-1.5
327.	-2.4
352.	-3.2

DATE	650120
SRVY	39
TIME	1200
62.	7.4
142.	5.4
151.	4.7
176.	3.0
202.	2.1
252.	.4
278.	-.1
328.	-2.2
353.	-2.9

DATE	650428
SRVY	40
TIME	1200
62.	7.5
176.	6.2
227.	2.2
328.	-2.5
353.	-2.6

DATE	650908
SRVY	41
TIME	1200
62.	7.5
141.	6.9
151.	6.7
176.	7.0
202.	4.5
227.	2.8
252.	.4
277.	-.4
327.	-.9
377.	-1.9

DATE	651020
SRVY	42
TIME	1200
61.	7.4
141.	7.2
152.	5.9
176.	3.8
226.	1.0
303.	-.6
328.	-1.0
352.	-1.9
378.	-1.9

DATE	651220
SRVY	43
TIME	1200
136.	7.2
141.	7.0
152.	6.0
176.	4.4
201.	3.5
227.	1.8
252.	.8
277.	.3
302.	-.6
353.	-2.0
378.	-2.9
403.	-3.6

DATE	660124
SRVY	44
TIME	1200
139.	4.5
175.	3.3
225.	1.5
250.	-.3
296.	-.5
300.	-1.3
325.	-2.3

DATE	660329
SRVY	45
TIME	1200
139.	5.4
174.	3.5
200.	2.4
225.	.8
250.	-.7
276.	-1.3
300.	-2.0
350.	-2.9

DATE	660426
SRVY	46
TIME	1200
139.	2.7
149.	6.1
167.	6.2
225.	-.3
250.	-1.5
275.	-1.8
300.	-2.8

DATE	661103
SRVY	47
TIME	1200
140.	5.2
150.	4.8
200.	1.9
250.	-.3
276.	-.4

DATE	670118
SRVY	48
TIME	1200
150.	5.2
200.	2.7
225.	1.2
249.	0.0
275.	-.8
325.	-2.8

DATE	670503
SRVY	49
TIME	1200
139.	4.0
174.	2.7
225.	.3
250.	-.9
300.	-1.4
325.	-1.9
351.	-2.9
376.	-3.9

DATE	670919
SRVY	50
TIME	1200
140.	6.8
150.	7.0
160.	7.0
200.	4.4
225.	2.2
250.	.7
301.	-.6
324.	-1.8

DATE	670910
SRVY	51
TIME	1200
139.	5.5
200.	2.5
250.	.9
300.	-.5
350.	-2.3

DATE	671213
SRVY	52
TIME	1200
140.	4.3
175.	2.1
200.	1.1
225.	.4
250.	-.1
300.	-1.2
325.	-1.7
351.	-1.9
375.	-2.7

DATE	680118
SRVY	53
TIME	1200
139.	2.9
150.	2.7
200.	.6
250.	-1.0
300.	-1.4

DATE	680124
SRVY	54
TIME	1200
140.	3.9
151.	2.6
181.	.8
200.	.2
250.	-.4
300.	-1.6
326.	-2.5

DATE	680130
SRVY	55
TIME	1200
140.	3.4
150.	2.7
175.	1.5
200.	.9
225.	.4
250.	-.3
275.	-1.0
300.	-1.6
325.	-2.5

DATE	680208
SRVY	56
TIME	1200
139.	4.0
150.	3.4
200.	1.2
250.	-.5
275.	-1.2

DATE	680215
SRVY	57
TIME	1200
140.	4.3
151.	3.0
200.	.5
251.	0.0
301.	-1.8
350.	-3.0
400.	-4.1

DATE	680221
SRVY	58
TIME	1200
140.	4.7
150.	3.8
158.	3.5
175.	2.9
200.	1.1
225.	.8
250.	.2
275.	-.8
300.	-1.9
325.	-2.9

DATE	680226
SRVY	59
TIME	1200
140.	5.3
150.	4.2
153.	3.8
175.	2.3
200.	1.2
225.	.3
250.	-.6
275.	-1.4
300.	-2.0
325.	-2.7
350.	-3.5

DATE	680307
SRVY	60
TIME	1200
140.	5.9
150.	3.5
175.	2.6
200.	1.8
225.	.7
250.	-.3
275.	-1.1
300.	-1.7

DATE	680313
SRVY	61
TIME	1200
140.	3.9
152.	3.3
200.	1.3
250.	-.5
270.	-1.2
301.	-2.2

DATE	680322
SRVY	62
TIME	1200
141.	3.9
150.	3.4
175.	2.7
200.	1.0
251.	-.3
274.	-1.6
301.	-2.6

DATE	681007
SRVY	63
TIME	1200
140.	6.8
150.	7.0
187.	7.7
190.	5.7
200.	4.2
225.	1.9
250.	.5
275.	-.4
300.	-1.5
325.	-2.3
350.	-3.0

DATE	681025
SRVY	64
TIME	1200
140.	7.2
150.	7.3
175.	7.8
200.	4.6
225.	2.2
250.	.7
275.	-.5
300.	-1.5

DATE	681115
SRVY	65
TIME	1200
140.	3.9
150.	3.4
175.	2.5
200.	1.8
225.	1.6
250.	0.0
275.	-.2
300.	-1.5
325.	-2.7
350.	-3.5

DATE	681220
SRVY	66
TIME	1200
140.	5.1
150.	4.7
175.	3.5
200.	2.0
225.	.9
250.	-.5
275.	-1.7
300.	-2.5
325.	-3.1

DATE	690113
SRVY	67
TIME	1200
140.	4.3
150.	3.7
175.	2.5
200.	1.0
250.	-.6
300.	-2.1
350.	-3.5

DATE	690122
SRVY	68
TIME	1200
140.	2.1
150.	1.6
175.	.7
200.	-.1
225.	-.8
250.	-1.6

DATE	690129
SRVY	69
TIME	1200
140.	2.1
150.	1.7
175.	.9
200.	-.2
225.	-1.4
250.	-2.1
275.	-2.6
300.	-2.0
325.	-2.6

DATE	690205
SRVY	70
TIME	1200
140.	2.6
150.	2.0
175.	.9
200.	.3
250.	-1.0
300.	-2.3
350.	-3.7
400.	-4.8

DATE	690212
SRVY	71
TIME	1200
140.	2.9
150.	2.2
175.	.7
200.	.2
250.	-.7
300.	-2.5
350.	-3.2

DATE	690219
SRVY	72
TIME	1200
140.	2.3
150.	1.8
175.	1.0
200.	.2
225.	-.6
250.	-1.2
275.	-1.9
300.	-2.2
325.	-2.8

DATE	690226
SRVY	73
TIME	1200
140.	2.3
150.	1.4
175.	-.4
200.	-.9
225.	-1.4
250.	-1.6
275.	-1.9
300.	-3.0

DATE	690305
SRVY	74
TIME	1200
140.	1.8
150.	1.6
175.	.7
200.	-.2
225.	-1.2
250.	-2.4
300.	-3.3
350.	-3.6
400.	-3.8
450.	-5.4

DATE	690312
SRVY	75
TIME	1200
140.	1.6
150.	.9
175.	.2
200.	.2
225.	-.4
250.	-1.0
275.	-1.7
300.	-2.1
325.	-2.6
350.	-3.3
400.	-4.3

DATE	690319
SRVY	76
TIME	1200
140.	2.4
150.	2.0
175.	1.1
200.	.5
250.	-.9
300.	-2.4
350.	-3.3

DATE	690527
SRVY	77
TIME	1200
140.	3.8
150.	3.1
200.	.1
250.	.2
300.	-1.3
350.	-2.7

DATE	690923
SRVY	78
TIME	1200
140.	9.9
150.	4.8
200.	1.0
250.	-.5
300.	-1.6

DATE	691023
SRVY	79
TIME	1200
140.	5.6
150.	4.8
175.	3.0
200.	-1.7
250.	-.2
300.	-2.1
350.	-4.0
400.	-6.0

DATE	691120
SRVY	80
TIME	1200
140.	4.7
150.	4.5
175.	3.1
200.	1.8
225.	.8
250.	0.0
270.	-1.0
300.	-2.0
325.	-3.1

DATE	691210
SRVY	81
TIME	1200
140.	3.5
150.	2.9
200.	.9
250.	-.2
300.	-1.3
350.	-2.0
375.	-3.0

DATE	700114
SRVY	82
TIME	1200
140.	3.2
150.	2.9
200.	1.1
250.	-.8
300.	-1.9
350.	-2.8
400.	-4.6

DATE	700121
SRVY	83
TIME	1200
140.	3.8
150.	3.4
200.	1.1
250.	-.8
300.	-1.9
350.	-2.5

DATE	700128
SRVY	84
TIME	1200
140.	3.9
150.	3.3
175.	1.8
200.	.9
250.	-.7
300.	-2.1
350.	-2.9

DATE	700204
SRVY	85
TIME	1200
140.	1.5
150.	1.1
200.	-.7
250.	-1.7
300.	-2.7

DATE	700211
SRVY	86
TIME	1200
140.	2.4
150.	1.9
200.	.1
250.	-1.4
300.	-1.8
340.	-2.4

DATE	700218
SRVY	87
TIME	1200
140.	2.8
150.	2.5
175.	1.7
200.	.9
225.	-1.4
250.	-1.3
300.	-.9
350.	-2.0

DATE	700225
SRVY	88
TIME	1200
140.	3.3
157.	2.9
185.	.1
200.	0.0
225.	-.1
250.	0.0
275.	-.0
300.	-1.6
350.	-3.2

DATE	700308
SRVY	89
TIME	1200
----	------
140.	4.3
150.	3.8
200.	1.3
250.	0.6
300.	-1.5
341.	-2.8

DATE	700311
SRVY	90
TIME	1200
----	------
140.	4.4
150.	4.0
200.	.9
250.	-.5
300.	-1.5
350.	-2.8
400.	-4.5

DATE	700318
SRVY	91
TIME	1200
----	------
140.	4.3
150.	3.5
200.	.8
250.	-.3
300.	-1.9
350.	-3.5
380.	-4.6

DATE	700918
SRVY	92
TIME	1200
----	------
140.	5.1
154.	4.3
190.	.8
200.	0.0
250.	-2.2

DATE	700826
SRVY	93
TIME	1200
----	------
140.	7.3
150.	7.9
200.	8.0
250.	7.8
300.	8.1
340.	9.2
360.	9.2
400.	3.3
426.	1.0
450.	0.0
500.	-1.2
550.	-2.4
600.	-4.3

DATE	701015
SRVY	94
TIME	1200
----	------
140.	7.4
150.	8.0
200.	7.9
250.	7.8
300.	8.3
332.	9.3
334.	6.2
350.	3.8
400.	.8
450.	0.0
500.	-2.3
550.	-3.9

DATE	701106
SRVY	95
TIME	1200
----	------
140.	7.9
150.	8.1
200.	8.4
250.	6.2
300.	2.9
350.	.9
400.	-.4
450.	-.8
483.	-2.1

DATE	701209
SRVY	96
TIME	1200
----	------
140.	7.8
150.	8.2
200.	8.3
250.	5.7
300.	2.7
350.	.6
400.	-1.9

DATE	701210
SRVY	97
TIME	1200
----	------
140.	8.3
150.	8.4
173.	8.3
200.	6.2
250.	3.6
300.	1.5
350.	.3
375.	-.6

DATE	710113
SRVY	98
TIME	1200
----	------
140.	8.4
150.	8.3
200.	5.3
250.	5.3
300.	.7
350.	-1.4
395.	-3.1

DATE	710209
SRVY	99
TIME	1200
----	------
140.	8.5
150.	8.4
161.	7.8
162.	7.2
200.	4.2
250.	1.5
300.	-.1
350.	-1.8
375.	-2.4

DATE	710311
SRVY	100
TIME	1200
----	------
140.	8.5
150.	8.1
200.	4.9
250.	1.6
300.	-1.7

DATE	710412
SRVY	101
TIME	1200
----	------
140.	5.6
150.	5.3
200.	3.7
235.	3.9
250.	.8
300.	-2.2
350.	-2.6
400.	-3.0

DATE	710607
SRVY	102
TIME	1200
----	------
140.	6.1
150.	6.4
172.	7.0
200.	5.4
225.	3.0
250.	.9
300.	-3.1
350.	-5.1

DATE	710816
SRVY	103
TIME	1200
----	------
140.	6.7
150.	7.1
195.	6.7
250.	1.1
300.	-1.9

DATE	711006
SRVY	104
TIME	1200
----	------
140.	8.1
150.	8.2
200.	3.1
250.	1.2
300.	-2.2
350.	-2.3
400.	-3.3

DATE	711213
SRVY	105
TIME	1200
----	------
140.	8.2
150.	8.1
180.	6.0
200.	5.0
213.	4.3
250.	.3
300.	-1.6
350.	-2.8

DATE	720110
SRVY	106
TIME	1200
----	------
140.	8.2
150.	8.2
164.	7.5
200.	3.2
250.	0.0
300.	-1.7

DATE	720214
SRVY	107
TIME	1200
----	------
140.	4.0
150.	3.6
200.	1.6
250.	-.2
300.	-1.8
350.	-3.2

DATE	720722
SRVY	108
TIME	1200
----	------
140.	3.3
150.	2.8
200.	1.1
250.	-.4
275.	-1.0

DATE	720317
SRVY	109
TIME	1200
----	------
140.	4.5
150.	3.9
200.	1.6
250.	-.3
300.	-2.3

DATE	720410
SRVY	110
TIME	1200
----	------
140.	5.6
150.	5.1
174.	4.8
200.	1.9
250.	-1.0
275.	-1.8

DATE	720821
SRVY	111
TIME	1300
----	------
140.	7.1
150.	7.3
161.	7.4
167.	6.1
175.	5.8
200.	4.3
225.	1.2
250.	-.2
300.	-2.3

DATE	721020
SRVY	112
TIME	1000
----	------
140.	5.1
150.	4.6
200.	1.7
250.	-.9
275.	-1.6

DATE	721208
BRVY	113
TIME	1300
140.	5.8
150.	5.9
175.	4.4
200.	1.7
225.	-.5
250.	-1.7

DATE	730105
BRVY	114
TIME	1000
140.	5.1
150.	4.4
175.	1.3
200.	-1.4

DATE	730216
BRVY	115
TIME	1000
140.	4.1
150.	3.4
175.	2.6
200.	-1.8

DATE	730316
BRVY	116
TIME	900
140.	4.6
150.	3.7
175.	1.4
200.	-2.0

DATE	730325
BRVY	117
TIME	800
140.	4.7
150.	3.5
175.	1.2
200.	-1.2
213.	-2.0

DATE	730405
BRVY	118
TIME	1300
140.	4.5
150.	3.2
175.	.8
200.	-1.5
225.	-2.2

DATE	730418
BRVY	119
TIME	1200
140.	5.2
150.	5.0
175.	2.9
200.	1.0
225.	-.6
250.	-1.8
275.	-2.4

DATE	621024
BRVY	1
TIME	1200
15.	8.8
33.	9.4
97.	8.5
117.	7.1
169.	5.9
223.	4.1
280.	1.0
345.	-.7
411.	-1.7

DATE	621101
BRVY	2
TIME	1800
17.	8.8
34.	9.3
77.	8.4
118.	6.8
167.	5.8
217.	4.0
268.	1.8
281.	1.3
319.	.3
368.	-.9

DATE	621109
BRVY	3
TIME	1200
56.	8.3
101.	7.3
168.	5.5
233.	4.1
298.	1.7
382.	0.0
468.	-1.0
508.	-2.0
568.	-3.6

DATE	621212
BRVY	4
TIME	1200
-9.	9.0
41.	8.7
145.	5.1
215.	2.1
284.	2.1
357.	-1.0
418.	-2.4
497.	-4.1

DATE	630109
BRVY	5
TIME	1200
-1.	9.6
25.	9.0
50.	8.7
75.	8.4
101.	7.4
126.	6.6
150.	5.9
201.	4.4
251.	2.7
301.	1.2
350.	-.1
377.	-.4
401.	-1.0
425.	-1.2

DATE	630116
BRVY	6
TIME	1200
27.	8.9
73.	8.8
100.	7.5
151.	6.1
175.	5.0
200.	4.6
249.	2.6
299.	.8
326.	.6
350.	.1
378.	0.0
401.	-.4
425.	-1.2

DATE	630122
BRVY	7
TIME	1200
151.	6.0
201.	5.0
248.	2.0
301.	.8
329.	.4
356.	-.1
400.	-.6

DATE	630130
BRVY	8
TIME	1200
-1.	9.6
50.	8.6
75.	8.2
101.	7.3
126.	6.7
175.	5.5
226.	3.5
250.	2.7
275.	2.3
288.	3.2
290.	1.9
300.	1.4
326.	.8
351.	0.0
376.	-.5
401.	-.6
426.	-1.0

DATE	630205
BRVY	9
TIME	1200
0.	9.6
24.	9.0
49.	8.6
75.	8.3
100.	7.5
126.	6.9
150.	6.0
177.	5.4
201.	4.5
223.	3.6
251.	2.7
276.	1.7
301.	1.0
325.	.2
351.	-.8
370.	-.7
400.	-1.8

DATE	630213
BRVY	10
TIME	1200
50.	8.6
75.	8.4
99.	7.8
126.	6.9
150.	6.0
181.	5.4
200.	4.9
250.	3.0
301.	.8
351.	-.1
370.	-1.0

DATE	630221
BRVY	11
TIME	1200
-1.	9.6
25.	8.8
75.	8.3
100.	7.5
150.	6.1
176.	5.0
202.	4.2
227.	3.7
250.	2.9
277.	1.9
301.	1.3
326.	.4
350.	0.0
375.	-.7
400.	-1.4

DATE	630227
BRVY	12
TIME	1200
-1.	9.6
24.	8.9
49.	8.6
74.	8.3
125.	6.8
150.	6.1
175.	5.1
199.	4.2
225.	4.1
270.	2.0
300.	.9
326.	.5
350.	0.0
375.	-.9
400.	-1.3

DATE	630307
BRVY	13
TIME	1200
125.	6.7
151.	6.0
176.	5.2
200.	4.8
227.	3.7
250.	2.5
275.	1.4
301.	.7
327.	0.0
351.	-.5
376.	-1.3

DATE	630313
BRVY	14
TIME	1200
-1.	9.6
23.	8.9
50.	8.5
74.	8.4
100.	7.5
150.	6.2
176.	5.5
200.	4.6
251.	2.3
301.	.8
350.	-.7
377.	-1.4

DATE	630321
BRVY	15
TIME	1200
75.	8.6
100.	7.3
150.	6.0
171.	5.5
200.	4.5
250.	2.2
301.	.2
325.	-.4
351.	-1.4

DATE	630402
BRVY	16
TIME	1200
150.	6.1
175.	5.3
225.	3.0
251.	1.7
301.	.3
325.	-.6
350.	-.8
376.	-1.7

DATE	630523
BRVY	17
TIME	1200
-1.	10.0
50.	9.0
100.	9.5
150.	10.4
200.	9.5
251.	10.3
300.	8.5
340.	6.6
342.	4.5
374.	1.8
400.	.9
451.	-.3
501.	-1.5

DATE	630611
BRVY	18
TIME	1200
0.	10.1
50.	8.9
100.	9.6
149.	10.9
200.	9.9
250.	10.2
275.	9.8
330.	7.8
352.	5.4
375.	2.1
427.	.7
474.	-.7
500.	-1.8

DATE	630626
BRVY	19
TIME	1200
158.	10.4
200.	9.8
250.	10.2
275.	9.6
325.	7.7
335.	5.2
350.	3.6
374.	1.9
449.	0.6
476.	-1.0

DATE	630712
BRVY	20
TIME	1200
0.	10.1
50.	8.9
100.	9.6
150.	10.6
175.	10.3
200.	9.8
250.	10.1
275.	9.4
310.	7.8
328.	5.5
372.	2.4
401.	1.0
450.	-.6

DATE	630724
BRVY	21
TIME	1200
-1.	10.1
25.	8.9
50.	8.9
99.	9.5
149.	10.5
176.	10.3
200.	9.8
250.	10.3
300.	8.8
325.	7.0
349.	4.5
373.	2.8
403.	1.8
429.	1.2
451.	.5
501.	-.4

DATE	630807
BRVY	22
TIME	1200
0.	10.0
25.	8.9
51.	8.9
100.	9.6
125.	10.3
150.	10.5
200.	9.8
250.	10.1
276.	9.5
301.	8.7
325.	6.9
350.	4.7
401.	2.2
451.	.5
501.	-.2
527.	-.6

DATE	630823
BRVY	23
TIME	1200
126.	10.3
150.	10.6
178.	10.4
199.	9.9
227.	10.0
250.	10.1
276.	9.5
300.	8.7
325.	7.1
350.	5.0
377.	3.7
400.	2.3
425.	1.2
452.	.6
501.	-.9

DATE	630905
BRVY	24
TIME	1200
225.	10.0
250.	10.3
300.	9.0
325.	7.4
350.	4.8
375.	2.9
401.	0.8

DATE	630925
SRVY	25
TIME	1200
74.	9.2
101.	9.7
125.	10.5
175.	9.8
201.	9.8
227.	10.0
252.	9.5
277.	8.3
303.	5.2
328.	4.5
353.	3.1
404.	-.1
429.	-.5

DATE	631009
SRVY	26
TIME	1200
-1.	9.9
25.	8.9
50.	9.0
76.	9.3
123.	10.4
151.	10.3
175.	9.9
202.	10.0
227.	10.3
253.	9.4
303.	4.8
328.	3.4
353.	1.5
402.	.3
428.	-.5
454.	-.9

DATE	631028
SRVY	27
TIME	1200
175.	9.8
201.	9.8
227.	10.0
252.	9.9
276.	9.2
327.	4.3
354.	2.3
404.	.3
428.	-.6
484.	-1.0

DATE	631114
SRVY	28
TIME	1200
-1.	9.9
24.	8.9
50.	9.0
74.	9.3
125.	10.3
151.	10.2
176.	9.7
201.	9.9
226.	9.9
251.	9.7
277.	8.9
302.	4.4
353.	1.3
403.	-.7
428.	-1.9

DATE	631231
SRVY	29
TIME	1200
-1.	9.9
24.	8.8
50.	8.8
74.	8.9
100.	9.3
151.	10.2
177.	10.0
201.	9.5
237.	9.8
252.	9.9
276.	9.7
291.	8.9
312.	5.8
327.	5.4
352.	3.5
378.	1.9
403.	1.2
427.	1.1
479.	-.4
529.	-3.0

DATE	640117
SRVY	30
TIME	1200
0.	10.0
50.	8.8
101.	9.5
151.	10.4
201.	9.5
252.	9.6
274.	9.1
277.	8.1
305.	5.8
355.	3.2
403.	1.6
454.	.2
504.	-.3
555.	-3.8

DATE	640218
SRVY	31
TIME	1200
50.	8.8
101.	9.4
151.	10.2
201.	9.7
252.	10.0
287.	9.4
302.	6.7
352.	3.8
403.	1.3
454.	.8
504.	-1.6

DATE	640312
SRVY	32
TIME	1200
0.	9.9
50.	8.9
100.	9.4
151.	10.5
201.	9.5
251.	10.0
281.	9.0
302.	6.2
326.	5.1
355.	2.6
377.	1.5
403.	.9
454.	.4
504.	-.6
530.	-1.6
542.	-2.6

DATE	640409
SRVY	33
TIME	1200
-1.	9.9
50.	8.9
101.	9.6
150.	10.3
201.	9.8
251.	10.4
275.	9.7
298.	8.0
304.	5.3
352.	2.4
402.	.1
453.	-.7
503.	-3.3

DATE	640527
SRVY	34
TIME	1200
-1.	9.9
50.	8.8
100.	9.6
151.	10.3
202.	9.9
[illegible]	9.6
282.	6.3
302.	5.8
352.	3.9
402.	1.0
453.	-2.4

DATE	640624
SRVY	35
TIME	1200
-1.	9.9
50.	9.1
100.	9.8
151.	10.6
201.	9.3
252.	9.8
267.	8.8
299.	5.8
352.	2.8
402.	.3
452.	-1.5
478.	-2.1

DATE	640831
SRVY	36
TIME	1200
0.	9.5
50.	8.9
100.	9.5
151.	10.3
201.	9.6
251.	9.6
301.	6.2
339.	4.9
352.	3.7
402.	1.0
452.	-.6
480.	-1.0
503.	-1.8

DATE	640925
SRVY	37
TIME	1200
0.	9.8
50.	8.9
100.	9.5
150.	10.4
201.	9.6
241.	9.4
251.	8.3
279.	6.8
301.	4.7
352.	2.6
402.	1.0
452.	-.1
453.	-.1

DATE	641203
SRVY	38
TIME	1200
0.	9.8
50.	8.9
100.	9.5
151.	10.1
201.	9.4
241.	8.9
251.	8.0
301.	4.6
352.	2.1
402.	.1
452.	-1.5
483.	-2.2

DATE	650120
SRVY	39
TIME	1200
0.	10.6
85.	9.0
141.	9.5
191.	10.4
241.	9.7
292.	8.5
302.	6.4
342.	4.7
393.	2.8
444.	1.3
494.	0.0
544.	-1.0
569.	-2.7

DATE	650228
SRVY	40
TIME	1200
0.	9.7
60.	9.0
105.	9.9
162.	10.4
212.	9.5
267.	7.7
301.	4.8
313.	3.1
363.	-1.1
413.	-3.8

DATE	650908
SRVY	41
TIME	1200
50.	8.9
100.	9.6
152.	10.2
252.	8.1
352.	1.8
403.	.1
453.	-1.3
504.	-1.8
529.	-2.1

DATE	651029
SRVY	42
TIME	1200
0.	10.1
51.	9.1
101.	9.5
151.	10.4
201.	9.4
252.	8.4
301.	3.8
352.	1.4
403.	-.5
453.	-2.0

DATE	651220
SRVY	43
TIME	1200
0.	10.1
50.	9.1
101.	9.8
151.	10.5
201.	9.7
252.	8.4
268.	7.6
302.	5.4
352.	2.9
403.	1.0
453.	-.2
503.	-2.6

DATE	660124
SRVY	44
TIME	1200
0.	10.2
50.	8.9
100.	9.5
150.	10.4
201.	8.7
250.	6.0
301.	4.2
351.	2.0
402.	.9
453.	.1
503.	-1.0
552.	-2.0

DATE	660329
SRVY	45
TIME	1200
200.	8.7
251.	4.9
301.	3.7
352.	1.4
402.	.3
453.	-1.1
503.	-2.1

DATE	660426
SRVY	46
TIME	1200
100.	9.5
151.	10.3
200.	8.1
251.	4.9
301.	2.5
352.	.8
402.	-.6
452.	-1.0
502.	-1.9

DATE	661103
SRVY	47
TIME	1200
0.	10.4
49.	8.9
100.	9.8
151.	10.3
166.	10.3
201.	8.2
252.	6.3
302.	4.2
352.	1.8
403.	-.3
432.	-1.5

DATE	670118
SRVY	48
TIME	1200
0.	10.3
51.	8.9
100.	9.7
151.	10.3
201.	7.9
239.	5.4
252.	5.2
277.	4.0
302.	2.7
327.	1.2
353.	.1
402.	-1.4

DATE	670503
SRVY	49
TIME	1200
0.	10.6
51.	9.0
101.	9.5
151.	10.3
178.	10.0
181.	7.2
227.	5.1
252.	4.2
277.	1.9
302.	.7
353.	.1
371.	0.0
403.	-.4
453.	-1.5
508.	-2.9

DATE	670915
SRVY	50
TIME	1200
0.	10.4
50.	9.0
100.	9.6
151.	10.4
178.	9.7
191.	7.1
201.	6.3
251.	6.1
301.	5.0
351.	3.9
401.	.3
450.	-1.1
500.	-1.1

DATE	670919
SRVY	51
TIME	1200
0.	10.1
50.	8.9
100.	9.4
150.	10.2
200.	8.6
236.	5.6
250.	4.9
300.	3.6
350.	1.3
400.	.3
451.	-1.1
500.	-2.1

DATE	671213
SRVY	52
TIME	1200
50.	9.0
100.	9.6
150.	10.1
171.	10.1
173.	7.8
200.	5.7
251.	3.2
301.	1.0
351.	-.3
400.	-1.6
450.	-2.8

DATE	680115
SRVY	53
TIME	1200
0.	10.5
50.	9.0
100.	9.5
142.	10.2
145.	6.2
150.	6.2
200.	4.7
251.	2.8
300.	1.2
350.	.2
400.	-1.0
450.	-1.9

DATE	680124
SRVY	54
TIME	1200
0.	10.5
50.	9.0
100.	9.7
141.	10.2
145.	7.0
150.	6.5
200.	4.8
237.	4.1
250.	3.0
300.	.9
336.	-.3
350.	-.4
400.	-1.5
425.	-2.3

DATE	680130
SRVY	55
TIME	1200
0.	10.5
50.	9.1
100.	9.7
150.	10.2
155.	7.0
200.	5.2
250.	2.5
300.	.5
350.	-.4
400.	-1.2
450.	-1.4
500.	-2.4

DATE	680208
SRVY	56
TIME	1200
0.	10.5
50.	9.0
100.	9.7
141.	10.1
144.	6.6
150.	6.6
200.	4.8
250.	2.4
300.	.8
325.	.4

DATE	680215
BRVY	57
TIME	1200
0.	10.8
90.	8.8
100.	9.7
118.	9.8
144.	6.4
200.	4.2
225.	3.8
251.	2.1
300.	.7
350.	.3
400.	-.5
490.	-1.9

DATE	680221
BRVY	58
TIME	1200
0.	10.2
50.	8.8
100.	8.9
137.	8.9
146.	6.5
150.	6.0
201.	4.1
250.	1.9
300.	.9
350.	.1
400.	-1.4
425.	-1.9

DATE	680226
BRVY	59
TIME	1200
-1.	10.4
90.	8.9
100.	9.5
137.	10.0
145.	8.6
191.	6.3
200.	4.3
290.	2.4
300.	1.0
391.	0.0
400.	0.0
500.	-1.9

DATE	680307
BRVY	60
TIME	1200
0.	10.3
50.	8.9
100.	9.7
138.	10.1
142.	6.7
200.	4.4
250.	3.0
300.	.7
351.	-.3
426.	-1.6

DATE	680313
BRVY	61
TIME	1200
0.	10.8
50.	8.9
100.	9.4
138.	10.0
141.	7.0
200.	4.5
250.	2.4
300.	.7
350.	-.7
400.	-1.6
450.	-3.3

DATE	680328
BRVY	62
TIME	1200
-1.	10.2
49.	8.8
100.	9.6
138.	10.0
143.	7.1
147.	6.9
150.	4.9
250.	.9
300.	.4
350.	-1.4

DATE	681007
BRVY	63
TIME	1200
0.	10.4
50.	8.9
100.	9.4
133.	9.8
153.	7.4
200.	5.8
250.	5.0
275.	2.6
300.	1.1
350.	-.9
400.	-2.0
450.	-2.6

DATE	681025
BRVY	64
TIME	1200
0.	10.4
50.	9.0
100.	9.5
143.	9.9
175.	6.4
200.	6.0
222.	6.1
225.	5.5
250.	3.3
275.	2.1
300.	1.3
350.	.1
375.	-.6

DATE	681115
BRVY	65
TIME	1200
0.	10.5
50.	9.0
100.	9.5
108.	9.3
150.	6.9
200.	4.8
250.	3.0
300.	1.4
350.	-.1
400.	-1.7
450.	-2.7

DATE	681220
BRVY	66
TIME	1200
0.	10.5
50.	9.0
100.	9.3
125.	8.4
150.	7.2
175.	6.2
200.	5.2
250.	2.5
300.	.7
350.	-1.0
400.	-2.4
425.	-2.0

DATE	690113
BRVY	67
TIME	1200
0.	10.6
50.	9.1
100.	9.4
106.	9.2
125.	8.0
150.	6.6
175.	5.2
200.	4.0
250.	1.5
300.	-.1
350.	-1.6
400.	-3.1

DATE	690122
BRVY	68
TIME	1200
0.	10.6
50.	9.0
100.	9.4
107.	9.4
109.	6.5
150.	5.4
200.	3.8
250.	2.3
300.	.6
350.	-.7
375.	-1.7

DATE	690129
BRVY	69
TIME	1200
0.	10.5
50.	9.1
100.	9.5
104.	9.9
108.	6.4
150.	5.1
200.	3.6
230.	2.6
250.	1.6
300.	-.1
350.	-1.4
400.	-1.9
425.	-2.7

DATE	690205
BRVY	70
TIME	1200
0.	10.4
50.	9.0
100.	9.3
106.	8.9
110.	6.5
150.	5.2
200.	3.7
250.	1.5
300.	-.1
350.	-.9
400.	-1.9
450.	-2.7
500.	-3.5

DATE	690212
BRVY	71
TIME	1200
0.	10.6
50.	9.0
100.	9.3
106.	8.8
111.	6.4
125.	6.0
150.	5.2
175.	4.9
200.	4.1
250.	1.5
300.	.2
350.	-.7
400.	-1.7
450.	-2.6
500.	-3.1

DATE	690219
BRVY	72
TIME	1200
0.	10.5
50.	9.0
99.	9.4
101.	7.2
150.	5.6
200.	4.2
250.	2.6
300.	.8
350.	-.6
400.	-1.6
450.	-2.1

DATE	690226
SRVY	73
TIME	1200
0.	10.4
50.	9.0
98.	9.3
100.	7.6
150.	5.6
200.	3.9
250.	1.8
300.	0.0
350.	-1.4
400.	-2.1

DATE	690305
SRVY	74
TIME	1200
0.	10.4
50.	8.7
97.	9.0
100.	7.9
150.	5.8
200.	4.9
227.	1.9
250.	1.2
300.	-.3
350.	-1.3
400.	-2.3
450.	-3.9
500.	-3.9
550.	-3.7
600.	-4.9

DATE	690312
SRVY	75
TIME	1200
0.	10.4
90.	9.0
96.	9.2
99.	8.2
150.	5.9
200.	4.2
250.	1.0
300.	.1
350.	-1.0
400.	-1.9
450.	-3.0

DATE	690319
SRVY	76
TIME	1200
0.	10.7
50.	8.9
94.	9.0
98.	7.8
150.	5.7
200.	4.5
250.	1.4
300.	.2
350.	-1.0
400.	-2.5

DATE	690[illegible]
SRVY	78
TIME	1200
0.	10.2
50.	8.9
100.	9.3
150.	6.7
200.	6.5
250.	6.2
300.	3.4
350.	1.4
400.	0.0
450.	-1.8

DATE	691023
SRVY	79
TIME	1200
0.	10.3
50.	8.9
94.	9.1
108.	7.4
143.	6.3
150.	6.2
200.	5.3
262.	5.6
275.	4.9
300.	3.2
350.	1.2
400.	-.7
450.	-2.4
500.	-4.3
550.	-5.5

DATE	691120
SRVY	80
TIME	1200
0.	10.3
25.	8.9
50.	8.9
92.	9.1
100.	8.2
150.	6.9
200.	5.7
210.	5.1
250.	3.5
300.	1.8
350.	.4
400.	-1.2
450.	-2.3
495.	-3.6

DATE	691216
SRVY	81
TIME	1200
0.	10.3
50.	9.0
91.	9.1
97.	8.4
150.	6.4
200.	4.8
250.	2.4
300.	.9
350.	-.4
400.	-1.9
450.	-2.7
500.	-3.8

DATE	700114
SRVY	82
TIME	1200
0.	10.5
50.	8.9
91.	9.0
100.	8.5
125.	7.0
150.	5.8
200.	4.2
250.	2.2
300.	.4
350.	-.9
400.	-1.9
450.	-2.9
500.	-3.7

DATE	700121
SRVY	83
TIME	1200
0.	10.7
50.	9.1
97.	9.3
100.	8.7
150.	6.6
200.	[illegible]
250.	2.3
300.	.8
350.	-.6
400.	-1.8
450.	-2.7

DATE	700128
SRVY	84
TIME	1200
0.	10.5
50.	9.0
88.	9.1
100.	8.6
150.	5.8
200.	4.3
250.	2.0
300.	.6
350.	-.9
400.	-2.6

DATE	700204
SRVY	85
TIME	1200
0.	10.5
30.	8.9
50.	9.0
89.	9.2
100.	8.6
114.	7.6
115.	6.9
150.	5.5
200.	3.3
250.	1.5
300.	-.1
350.	-1.6
400.	-2.9

DATE	700211
SRVY	86
TIME	1200
0.	10.5
23.	8.9
91.	9.1
100.	8.4
150.	5.3
200.	3.1
250.	1.0
300.	-.7
350.	-1.8
400.	-2.5

DATE	700218
SRVY	87
TIME	1200
0.	10.6
50.	9.0
100.	8.6
125.	7.1
150.	5.9
175.	5.1
200.	3.8
250.	1.4
300.	-.2
350.	-1.2
400.	-1.7

DATE	700225
SRVY	88
TIME	1200
0.	10.4
50.	8.8
90.	8.8
100.	8.3
129.	6.2
150.	5.5
172.	4.9
200.	3.4
250.	.7
300.	-.5
350.	-1.5
400.	-2.6

DATE	700304
SRVY	89
TIME	1200
0.	10.5
50.	8.9
94.	8.8
100.	8.3
150.	5.7
179.	4.9
200.	3.6
250.	1.0
300.	-.2
350.	-1.3
400.	-2.0

DATE	700311
BRVY	90
TIME	1200
----	------
0.	10.4
50.	9.0
93.	9.0
100.	8.6
150.	5.8
200.	3.7
250.	1.3
300.	.3
350.	-.4
400.	-1.0
450.	-2.5
500.	-3.3
550.	-3.9

DATE	700318
BRVY	91
TIME	1200
----	------
0.	10.9
50.	9.0
92.	8.9
150.	5.6
200.	3.8
250.	1.3
300.	.7
350.	-.9
400.	-1.7
450.	-2.7
500.	-3.1

DATE	700518
BRVY	92
TIME	1200
----	------
0.	10.5
50.	8.8
87.	9.0
100.	8.1
117.	6.9
150.	5.3
200.	4.0
250.	1.5
300.	.1
350.	-1.5
400.	-2.7

DATE	700826
BRVY	93
TIME	1200
----	------
0.	10.3
50.	8.9
88.	8.9
115.	7.6
150.	8.3
175.	8.6
189.	9.8
200.	10.2
222.	10.3
244.	8.9
250.	8.9
300.	9.3
315.	8.8
350.	9.6
400.	1.5
450.	-.3
500.	-.9
550.	-2.3
600.	-3.8

DATE	701015
BRVY	94
TIME	1200
----	------
0.	10.2
50.	8.9
100.	8.2
150.	8.2
172.	8.6
190.	10.0
200.	10.2
246.	8.8
300.	9.1
334.	6.9
350.	5.2
400.	2.0
450.	.0
500.	-1.7
550.	-3.1

DATE	701106
BRVY	95
TIME	1200
----	------
0.	10.4
50.	8.8
86.	9.0
100.	8.3
119.	7.9
150.	8.2
192.	9.8
200.	10.1
250.	8.9
284.	9.1
288.	5.9
300.	4.9
350.	1.0
400.	.2
450.	-1.0

DATE	701209
BRVY	96
TIME	1200
----	------
0.	10.4
50.	8.9
100.	8.4
150.	7.9
200.	9.9
250.	8.9
275.	8.4
300.	5.9
350.	3.4
400.	.9
450.	-.4
500.	-1.0

DATE	701218
BRVY	97
TIME	1200
----	------
0.	10.4
14.	9.8
50.	8.9
86.	9.1
100.	8.3
117.	7.4
150.	8.2
200.	10.1
224.	10.1
232.	8.8
250.	7.0
300.	4.0
350.	1.0
400.	.2
425.	-.3

DATE	710113
BRVY	98
TIME	1200
----	------
0.	10.5
50.	8.0
100.	8.0
120.	7.2
150.	7.9
200.	9.9
228.	9.6
237.	6.9
250.	6.0
300.	3.3
350.	1.0
400.	-.3
450.	-1.0
500.	-2.0

DATE	710209
BRVY	99
TIME	1200
----	------
0.	10.4
50.	8.9
100.	[illegible]
119.	7.3
150.	9.1
200.	10.0
227.	9.6
232.	8.0
235.	6.4
250.	5.2
300.	2.9
350.	.7
400.	-1.7

DATE	710311
BRVY	100
TIME	1200
----	------
0.	10.5
50.	8.8
88.	9.0
100.	8.2
120.	7.2
150.	8.0
200.	9.8
215.	9.9
233.	5.6
250.	5.1
300.	2.0
350.	.1
400.	-1.4
450.	-2.3

DATE	710412
BRVY	101
TIME	1200
----	------
0.	10.6
50.	8.9
100.	8.8
125.	7.1
150.	7.9
200.	9.8
210.	9.7
212.	7.8
250.	5.0
300.	3.2
350.	.4
400.	-1.1
450.	-2.6
500.	-3.1

DATE	710607
BRVY	102
TIME	1200
----	------
0.	10.4
50.	8.9
100.	8.1
150.	7.8
200.	9.6
207.	9.8
220.	6.5
250.	5.8
300.	4.1
350.	.7
400.	-1.6
450.	-2.6
500.	-4.5

DATE	710816
BRVY	103
TIME	1200
----	------
0.	10.8
50.	7.9
100.	8.0
150.	7.7
203.	9.6
219.	6.8
250.	5.8
300.	5.9
330.	1.9
400.	-.9
450.	-1.3

DATE	711004
BRVY	104
TIME	1200
----	------
0.	10.8
50.	8.8
100.	8.0
150.	7.7
200.	9.4
250.	5.6
300.	3.5
350.	1.6
400.	.1
450.	-1.8
475.	-4.8

DATE	711213
BRVY	105
TIME	1200
----	------
0.	10.6
50.	8.9
100.	8.1
150.	7.7
200.	9.3
250.	5.3
300.	3.0
350.	1.0
400.	.3
450.	-1.4
475.	-2.0

DATE	720110
SRVY	106
TIME	1200
----	------
0.	10.2
50.	8.8
100.	8.0
150.	7.7
200.	6.3
250.	5.3
300.	2.4
350.	.4
400.	-1.0
425.	-1.8

DATE	72[illegible]18
SRVY	[illegible]
TIME	[illegible]
----	------
0.	10.8
15.	9.4
50.	8.9
100.	8.0
150.	7.9
180.	8.4
200.	6.4
250.	4.0
300.	2.0
350.	.3
400.	-1.4
450.	-2.4

DATE	720222
SRVY	108
TIME	1200
----	------
0.	10.9
10.	9.5
50.	8.7
100.	8.0
150.	7.2
200.	6.3
250.	4.1
300.	1.7
350.	0.0
400.	-1.4

DATE	720317
SRVY	109
TIME	1200
----	------
0.	10.6
25.	8.7
50.	8.8
100.	7.9
150.	7.2
186.	6.5
200.	5.5
250.	3.1
300.	1.2
350.	-.3
375.	-1.0

DATE	720410
SRVY	110
TIME	1200
----	------
0.	10.8
50.	8.8
100.	8.0
150.	7.3
200.	5.1
250.	3.2
300.	1.4
350.	-.1
387.	-1.6

DATE	720821
SRVY	111
TIME	1400
----	------
0.	10.3
25.	8.9
50.	8.7
100.	7.9
150.	7.4
200.	6.2
250.	5.3
267.	4.5
300.	2.3
350.	.4
400.	-.9
450.	-2.1

DATE	721020
SRVY	112
TIME	1000
----	------
0.	10.5
50.	8.8
100.	8.2
150.	7.6
200.	6.1
250.	4.4
300.	2.6
350.	.7
400.	-.1
425.	-1.0

DATE	721208
SRVY	113
TIME	1400
----	------
0.	10.7
50.	8.6
100.	7.7
150.	6.4
170.	6.7
200.	5.6
250.	2.7
300.	.9
350.	-.6
375.	-1.1

DATE	730105
SRVY	114
TIME	1000
----	------
0.	10.7
50.	8.6
100.	8.1
132.	7.9
150.	7.2
200.	5.4
250.	[illegible]
300.	[illegible]
350.	-.5
375.	-1.4

DATE	730216
SRVY	115
TIME	1000
----	------
0.	10.3
50.	8.8
100.	8.0
150.	6.7
200.	4.5
250.	2.2
300.	.6
350.	-.8
400.	-2.0

DATE	730316
SRVY	116
TIME	900
----	------
0.	10.4
50.	8.6
100.	7.9
150.	6.6
200.	5.4
225.	3.6
250.	2.1
300.	.3
350.	-1.3
400.	-1.9

DATE	730325
SRVY	117
TIME	800
----	------
17.	9.2
50.	8.8
100.	8.2
150.	7.2
200.	5.4
250.	2.8
300.	.9
350.	-.7
400.	-1.6
413.	-2.0

DATE	730409
SRVY	118
TIME	1300
----	------
0.	11.0
17.	9.2
50.	8.6
100.	8.0
150.	7.2
161.	7.0
200.	4.5
250.	1.8
300.	.2
350.	-1.3
400.	-2.2

DATE	730418
SRVY	119
TIME	1200
----	------
0.	11.1
18.	9.1
50.	8.8
100.	8.1
150.	7.2
164.	7.1
200.	4.7
250.	2.5
300.	.7
350.	-.7
400.	-2.3

DATE	821024
SRVY	1
TIME	1200
49.	10.7
84.	10.5
137.	9.7
236.	7.6
280.	6.6
320.	6.3
374.	2.9
425.	.2
521.	-2.2

DATE	821101
SRVY	2
TIME	1200
71.	10.7
93.	10.6
140.	9.8
205.	8.7
244.	7.3
310.	6.8
363.	3.7
401.	1.0
483.	-1.4

DATE	821109
SRVY	3
TIME	1200
29.	10.0
72.	10.5
118.	10.1
164.	9.0
213.	8.0
270.	7.3
321.	6.2
364.	2.8
386.	2.1
423.	.3
519.	-2.8

DATE	821212
SRVY	4
TIME	1200
65.	10.1
181.	9.6
172.	8.7
224.	7.7
274.	5.6
335.	2.2
406.	.3
498.	-2.0
545.	-2.1
619.	-3.6

DATE	830109
SRVY	5
TIME	1200
-1.	10.0
9.	10.6
24.	10.0
44.	11.6
49.	10.9
72.	10.4
99.	10.0
109.	10.5
114.	10.9
123.	9.6
150.	9.4
174.	8.9
199.	8.1
225.	7.7
250.	6.7
279.	5.9
300.	5.0
350.	2.9
400.	.9
450.	-.2
476.	-1.0
530.	-1.5

DATE	830116
SRVY	6
TIME	1200
-1.	10.8
24.	9.9
44.	11.2
48.	10.5
99.	10.3
109.	10.5
115.	10.4
124.	9.8
150.	9.3
176.	8.8
200.	8.2
225.	7.5
252.	6.6
299.	5.5
348.	2.9
401.	.9
442.	.1
475.	-.3
501.	-.6
525.	-1.2

DATE	830122
SRVY	7
TIME	1200
277.	5.9
300.	5.3
346.	3.0
401.	.9
435.	-.1
451.	-.7
475.	-1.2

DATE	830130
SRVY	8
TIME	1200
-1.	10.6
25.	10.6
43.	11.1
50.	10.8
75.	10.5
100.	10.1
150.	9.2
200.	8.0
225.	7.5
275.	5.8
300.	4.5
325.	3.5
351.	3.0
375.	2.6
425.	.4
450.	-.1
501.	-.6
525.	-1.1

DATE	830205
SRVY	9
TIME	1200
49.	10.8
99.	10.0
126.	9.1
151.	9.0
175.	8.9
200.	7.9
250.	6.6
276.	5.9
300.	4.8
350.	3.3
375.	2.0
400.	1.0
425.	.3
451.	-.2
476.	-.9

DATE	830213
SRVY	10
TIME	1200
279.	5.9
300.	4.9
350.	2.9
374.	2.1
400.	1.1
426.	0.8
451.	-.6
477.	-1.1

DATE	830221
SRVY	11
TIME	1200
-1.	10.6
25.	10.0
50.	10.7
100.	10.1
150.	9.3
200.	8.2
225.	7.8
250.	6.9
299.	5.0
350.	3.1
400.	1.3
450.	-.1
500.	-1.4

DATE	830227
SRVY	12
TIME	1200
174.	8.8
224.	7.5
250.	7.0
275.	6.0
300.	4.7
326.	4.3
350.	2.9
375.	1.4
400.	.9
425.	.5
451.	-.2
500.	-1.7

DATE	830307
SRVY	13
TIME	1200
25.	10.0
40.	11.1
50.	10.6
100.	10.0
130.	9.5
150.	9.0
174.	8.8
200.	8.2
226.	7.8
250.	6.8
281.	5.7
301.	4.9
351.	3.1
400.	1.0
451.	-.5
477.	-1.1

DATE	830313
SRVY	14
TIME	1200
-1.	10.5
25.	10.1
50.	10.6
100.	10.1
149.	9.2
173.	8.8
201.	8.0
225.	7.4
250.	6.6
276.	5.9
301.	5.0
350.	2.8
401.	.8
451.	-.5
475.	-1.1

DATE	830321
SRVY	15
TIME	1200
99.	10.1
122.	9.5
150.	9.2
200.	8.0
226.	7.5
250.	6.5
275.	5.9
301.	5.3
325.	4.3
349.	2.9
376.	2.1
400.	1.1
425.	.3
450.	-.4

DATE	830402
SRVY	16
TIME	1200
200.	8.1
225.	7.7
250.	6.7
300.	5.0
350.	3.5
375.	2.1
400.	1.1
451.	-.1
500.	-1.3

DATE	630523
SRVY	17
TIME	1200
87.	10.1
103.	9.9
150.	9.0
201.	7.9
225.	7.3
251.	6.2
270.	5.9
301.	5.8
325.	5.4
350.	3.7
375.	2.4
400.	1.3
451.	.2
476.	-.8
501.	-.8
526.	-1.5

DATE	630611
SRVY	18
TIME	1200
-1.	10.5
24.	10.1
50.	10.8
75.	10.4
100.	10.1
150.	9.0
173.	8.9
200.	8.2
225.	7.6
251.	6.7
274.	6.2
300.	5.1
324.	4.1
351.	3.4
375.	2.4
401.	1.6
425.	.9
451.	.4
501.	-1.0

DATE	630626
SRVY	19
TIME	1200
26.	10.1
50.	10.5
100.	10.1
151.	9.0
201.	8.0
225.	7.0
251.	6.5
301.	4.8
327.	3.9
352.	3.4
375.	1.8
401.	.9
426.	.4
451.	.2
476.	-.5
500.	-1.1

DATE	630712
SRVY	20
TIME	1200
-1.	10.7
25.	10.2
49.	10.3
100.	10.3
149.	9.1
201.	8.1
225.	6.9
250.	6.5
300.	5.2
325.	4.5
350.	2.8
375.	1.4
400.	.5
450.	-.6

DATE	630724
SRVY	21
TIME	1200
25.	10.2
49.	10.6
100.	10.5
124.	9.7
150.	9.4
174.	8.5
200.	8.1
226.	7.6
250.	6.8
276.	6.3
300.	5.7
325.	5.3
350.	3.9
400.	1.8
425.	1.2
450.	.8
472.	0.0

DATE	630807
SRVY	22
TIME	1200
-1.	10.7
25.	10.2
49.	10.4
100.	10.3
124.	9.5
150.	9.0
200.	8.0
226.	7.0
250.	6.5
272.	6.0
301.	5.6
350.	4.2
400.	1.4
428.	1.0
451.	.2
478.	0.0
501.	-.6

DATE	630823
SRVY	23
TIME	1200
74.	10.4
100.	10.1
150.	9.4
200.	8.3
250.	6.7
276.	6.0
300.	5.8
329.	5.2
351.	4.3
376.	2.6
401.	1.4
424.	.7
451.	.5
501.	-1.1

DATE	630905
SRVY	24
TIME	1200
175.	8.8
200.	8.4
250.	6.9
274.	6.4
300.	6.1
325.	5.5
350.	3.9
375.	2.8

DATE	630925
SRVY	25
TIME	1200
50.	10.4
74.	10.3
101.	9.6
120.	9.4
151.	8.7
176.	7.9
226.	6.7
252.	5.9
277.	4.5
303.	4.2
328.	3.9
353.	3.8
377.	2.3
403.	1.7
454.	.8
478.	-.1

DATE	631009
SRVY	26
TIME	1200
-1.	10.5
25.	10.3
50.	10.4
101.	9.4
126.	9.0
152.	8.4
176.	7.7
201.	6.7
226.	6.2
252.	5.2
302.	4.2
327.	3.8
352.	2.8
377.	1.5
403.	.9
428.	0.0
454.	-.5
479.	-.9

DATE	631028
SRVY	27
TIME	1200
151.	8.4
201.	7.4
251.	6.2
302.	4.2
353.	2.1
402.	.7
428.	.2
458.	-.5
479.	-.6
529.	-.9

DATE	631114
SRVY	28
TIME	1200
-1.	10.6
50.	10.4
76.	9.9
102.	9.3
126.	9.0
151.	8.4
201.	6.7
252.	4.8
278.	4.3
302.	3.1
328.	1.8
353.	1.0
403.	0.0
429.	-.7
453.	-1.0

DATE	631231
SRVY	29
TIME	1200
-1.	10.6
25.	10.1
50.	10.6
76.	10.1
101.	10.0
126.	9.1
151.	8.6
201.	8.3
227.	7.4
252.	6.4
277.	5.9
302.	5.2
353.	4.4
403.	3.2
453.	1.9
504.	.3
554.	-.7
605.	-1.7
655.	-2.7
680.	-3.1

DATE	640117
SRVY	30
TIME	1200
-1.	10.6
27.	10.1
50.	10.3
100.	10.1
151.	9.1
202.	8.0
252.	6.7
302.	5.2
353.	3.8
403.	2.7
454.	1.7
504.	.7
540.	0.0

DATE	640214
SRVY	31
TIME	1200
-1.	10.6
50.	10.6
100.	10.0
151.	9.3
201.	8.2
251.	6.9
302.	5.5
353.	4.7
403.	3.4
453.	1.9
503.	.6
539.	0.0

DATE	640312
SRVY	32
TIME	1200
0.	10.7
50.	10.8
101.	10.2
151.	9.2
201.	8.0
228.	7.4
252.	6.6
302.	5.9
353.	4.9
403.	4.0
454.	1.8
504.	.2
554.	-1.1
580.	-1.8

DATE	640409
SRVY	33
TIME	1200
50.	10.8
100.	10.0
151.	9.0
201.	7.9
252.	7.0
302.	5.8
353.	4.7
403.	3.6
454.	1.7
504.	0.0
555.	-1.1
604.	-2.5
655.	-3.7

DATE	640527
SRVY	34
TIME	1200
-1.	10.9
50.	10.5
101.	10.4
151.	9.1
201.	8.6
252.	7.6
302.	6.0
352.	5.4
403.	4.6
453.	2.7
504.	.2
553.	-1.6
604.	-2.8

DATE	640624
SRVY	35
TIME	1200
0.	10.8
50.	10.8
100.	10.8
151.	9.1
201.	8.4
252.	7.8
302.	6.0
352.	5.8
403.	5.0
453.	2.4
504.	.1
554.	-1.1
604.	-2.5

DATE	640831
SRVY	36
TIME	1200
0.	10.4
50.	10.5
101.	9.3
151.	9.1
201.	8.3
252.	7.1
302.	6.1
352.	6.0
403.	4.9
453.	1.6
503.	.1
554.	-1.5
604.	-2.8

DATE	640925
SRVY	37
TIME	1200
50.	10.2
101.	9.9
152.	9.0
202.	8.6
252.	6.9
302.	5.0
352.	3.3
403.	1.9
453.	.7
503.	.1

DATE	641203
SRVY	38
TIME	1200
0.	10.4
50.	10.4
101.	10.0
151.	9.4
202.	8.8
252.	7.0
302.	5.7
352.	4.3
403.	2.6
453.	.6
503.	-.5
553.	-2.2
574.	-3.0

DATE	650120
SRVY	39
TIME	1200
50.	10.1
100.	9.9
151.	8.9
201.	8.7
252.	7.4
302.	5.7
352.	4.0
404.	2.9
453.	1.0
504.	.6
554.	-.8
605.	-2.0

DATE	650428
SRVY	40
TIME	1200
0.	10.8
50.	10.5
100.	10.1
151.	9.6
201.	8.9
251.	7.3
303.	6.1
352.	5.4
403.	2.9
453.	.8
504.	-.5
554.	-2.3
604.	-2.6

DATE	650708
SRVY	41
TIME	1200
50.	10.5
101.	10.0
151.	9.6
201.	8.5
251.	7.3
303.	6.0
352.	6.0
378.	5.7
403.	2.5
453.	0.0
504.	-1.8
554.	-2.5

DATE	651029
SRVY	42
TIME	1200
99.	9.9
150.	9.1
200.	8.6
251.	7.1
301.	6.2
319.	6.8
352.	3.6
402.	.8
453.	0.0
502.	-1.0
553.	-2.0

DATE	651220
SRVY	43
TIME	1200
0.	10.5
50.	10.1
101.	9.4
151.	9.1
200.	7.3
250.	6.5
264.	6.4
301.	4.3
351.	1.9
402.	.2
492.	-.7
503.	-2.4
553.	-3.6

DATE	660124
SRVY	44
TIME	1200
0.	9.7
50.	10.5
100.	10.0
151.	9.4
201.	9.6
251.	7.0
302.	5.0
352.	3.4
402.	1.7
452.	.4
503.	-.4
553.	-1.4
603.	-2.0

DATE	660329
SRVY	45
TIME	1200
0.	9.7
50.	10.5
100.	10.0
151.	9.4
201.	9.4
251.	7.4
301.	5.5
352.	4.7
376.	3.4
402.	2.0
427.	1.0
476.	-.1
503.	-1.0
528.	-1.6
553.	-2.2

DATE	660426
SRVY	46
TIME	1200
0.	9.7
50.	10.7
101.	10.3
151.	9.4
201.	9.5
251.	7.5
302.	5.8
352.	4.4
402.	2.4
452.	.7
502.	-.2

DATE	661103
SRVY	47
TIME	1200
50.	10.5
100.	10.3
150.	9.7
201.	8.8
277.	7.3
302.	6.3
330.	4.9
402.	1.7
452.	.5
503.	-1.0
528.	-1.0

DATE	670118
SRVY	48
TIME	1200
0.	10.6
50.	10.5
100.	10.3
151.	9.8
251.	7.9
302.	5.8
352.	4.3
402.	2.6
503.	-.8
553.	-1.7

DATE	670503
BRVY	49
TIME	1200
0.	10.9
50.	10.5
151.	9.6
201.	8.6
251.	7.9
301.	6.6
352.	5.6
382.	4.5
402.	3.6
452.	1.5
503.	-.8
554.	-.9
603.	-1.7
620.	-2.7

DATE	670915
BRVY	50
TIME	1200
50.	9.4
150.	8.8
200.	7.9
250.	6.8
300.	4.2
350.	3.7
400.	2.2
450.	-.5
500.	-1.8

DATE	670919
BRVY	51
TIME	1200
0.	11.4
50.	10.4
100.	11.0
150.	9.8
200.	9.2
250.	8.0
300.	7.4
401.	2.2
451.	-.4
500.	-1.5

DATE	671213
BRVY	52
TIME	1200
0.	10.5
50.	10.5
100.	10.1
150.	9.8
200.	8.7
250.	7.9
292.	7.1
351.	3.6
401.	1.5
450.	0.0
500.	-1.4
550.	-2.0

DATE	680115
BRVY	53
TIME	1200
-1.	10.8
50.	11.2
100.	10.1
150.	9.6
200.	8.7
238.	8.3
250.	7.0
350.	3.1
400.	1.6
450.	0.0
499.	-1.1
549.	-1.9
600.	-2.1

DATE	680124
BRVY	54
TIME	1200
0.	10.8
50.	10.7
100.	10.3
150.	9.4
200.	8.8
246.	8.4
301.	4.9
350.	4.1
401.	1.2
449.	.7
500.	-.7
550.	-.9

DATE	680130
BRVY	55
TIME	1200
-1.	10.8
50.	10.7
100.	10.2
149.	9.7
200.	8.8
250.	7.5
301.	5.7
350.	3.6
400.	1.6
450.	.1
499.	-1.7
550.	-2.7

DATE	680208
BRVY	56
TIME	1200
0.	10.8
49.	10.7
99.	10.2
149.	9.5
200.	8.4
250.	7.9
300.	5.2
350.	2.9
401.	1.0
450.	0.0

DATE	680215
BRVY	57
TIME	1200
-1.	10.8
49.	10.8
100.	10.1
149.	9.4
200.	8.4
250.	7.9
300.	5.2
350.	3.4
400.	1.1
450.	-.1
500.	-1.8
550.	-2.5
600.	-3.1

DATE	680221
BRVY	58
TIME	1200
-1.	10.8
50.	10.6
100.	10.1
150.	9.4
200.	8.8
249.	7.7
300.	5.5
351.	3.5
400.	1.2
450.	.1
500.	-1.1
585.	-2.0

DATE	680226
BRVY	59
TIME	1200
0.	10.8
50.	10.6
100.	10.1
149.	9.3
200.	8.6
290.	7.7
300.	5.8
350.	3.0
400.	.9
450.	-.5
499.	-1.4
550.	-2.9

DATE	680307
BRVY	60
TIME	1200
0.	10.9
49.	10.9
100.	10.1
150.	9.5
200.	8.7
250.	7.7
300.	5.1
350.	3.5
400.	1.1
450.	-.2
500.	-1.2

DATE	680313
BRVY	61
TIME	1200
-1.	10.9
50.	10.9
100.	10.1
200.	8.5
250.	7.5
300.	5.0
350.	2.9
400.	.9
450.	-.5
500.	-1.9
550.	-3.0

DATE	680322
BRVY	62
TIME	1200
-1.	10.8
100.	10.1
150.	9.5
200.	8.7
250.	8.0
300.	5.4
331.	4.3
350.	3.1
401.	1.0
449.	.1
500.	-2.6
584.	-2.9

DATE	681007
BRVY	63
TIME	1200
50.	10.6
100.	10.3
150.	9.5
200.	8.8
250.	7.8
300.	6.5
325.	6.4
350.	4.1
400.	1.3
450.	1.1
500.	-1.7
550.	-3.1

DATE	681025
BRVY	64
TIME	1200
0.	10.5
50.	10.4
100.	10.2
150.	9.3
200.	8.5
250.	7.5
300.	6.7
350.	3.3
400.	1.2
450.	-.4
475.	-1.1

DATE	681115
SRVY	65
TIME	1200
0.	10.7
50.	10.4
100.	10.1
150.	9.5
200.	9.0
250.	7.2
300.	4.7
350.	2.7
400.	1.3
450.	-.1
500.	-.8
550.	-1.9
600.	-3.2

DATE	681220
SRVY	66
TIME	1200
0.	10.3
50.	10.1
100.	10.0
150.	9.4
200.	8.9
250.	7.9
300.	5.4
350.	3.7
400.	1.9
450.	0.0
500.	-1.7
550.	-2.7

DATE	690113
SRVY	67
TIME	1200
0.	10.6
50.	10.4
100.	10.0
150.	9.4
200.	8.9
250.	7.4
300.	5.2
350.	3.4
375.	2.2
400.	1.3
450.	-.3
500.	-1.6
550.	-2.7
600.	-3.4

DATE	690122
SRVY	68
TIME	1200
0.	10.7
50.	10.5
100.	10.0
150.	9.3
200.	8.9
250.	7.2
300.	4.5
350.	2.6
400.	.9
450.	-.3
500.	-1.5
585.	-1.8

DATE	690129
SRVY	69
TIME	1200
0.	10.7
50.	10.4
100.	10.0
150.	9.3
200.	8.9
250.	7.4
300.	4.7
350.	2.8
400.	.8
450.	-.1
500.	-1.4
550.	-2.1
600.	-3.1

DATE	690205
SRVY	70
TIME	1200
0.	10.7
50.	10.6
100.	10.1
150.	9.4
200.	8.9
250.	7.3
300.	4.9
335.	3.3
350.	2.7
400.	1.2
450.	0.0
500.	-1.1
550.	-2.5
600.	-3.6
625.	-4.3

DATE	690212
SRVY	71
TIME	1200
.	10.7
50.	10.5
100.	10.1
150.	9.5
200.	8.9
250.	7.4
300.	5.1
335.	3.9
350.	3.3
400.	1.2
450.	0.0
500.	-1.2
550.	-2.2
575.	-2.7

DATE	690219
SRVY	72
TIME	1200
0.	10.7
50.	10.6
100.	10.1
150.	9.6
200.	9.1
250.	7.6
285.	5.9
300.	5.1
350.	3.0
400.	1.5
450.	.1
500.	-1.1
550.	-2.2

DATE	690226
SRVY	73
TIME	1200
0.	10.7
50.	10.6
100.	9.9
150.	9.5
200.	9.0
250.	7.5
300.	3.5
320.	4.7
350.	3.5
400.	1.3
450.	-.8
500.	-1.1
550.	-1.7

DATE	690305
SRVY	74
TIME	1400
0.	10.7
50.	10.7
100.	10.0
150.	9.6
200.	8.9
250.	7.9
300.	5.9
325.	5.1
350.	4.2
400.	2.7
450.	.7
500.	-1.6
550.	-2.1
600.	-1.7
650.	-3.2
700.	-4.3

DATE	690312
SRVY	75
TIME	1200
0.	10.7
50.	10.6
100.	9.9
150.	9.3
200.	8.9
250.	7.5
300.	5.5
350.	4.2
400.	1.6
450.	-.3
500.	-1.7
550.	-2.6

DATE	690319
SRVY	76
TIME	1200
0.	10.6
50.	10.7
100.	9.9
150.	9.4
200.	9.1
250.	7.8
300.	5.9
330.	5.4
350.	4.3
400.	1.7
450.	.2
500.	-1.4
550.	-2.5

DATE	690527
SRVY	77
TIME	1200
50.	10.3
100.	11.1
150.	9.2
200.	8.9
250.	8.3
300.	6.9
350.	5.4
400.	2.5
450.	-.3
500.	-1.0
550.	-2.1

DATE	690923
SRVY	78
TIME	1800
0.	10.7
50.	10.4
100.	10.2
150.	9.4
200.	8.9
250.	8.1
300.	6.6
350.	3.4
400.	1.6
450.	-.3
500.	-2.0

DATE	691023
SRVY	79
TIME	1200
50.	10.7
100.	10.2
150.	9.2
200.	8.8
250.	7.8
274.	7.3
298.	4.6
350.	1.9
400.	.3
450.	-1.1
500.	-2.1
550.	-3.2
600.	-3.6
625.	-4.8

DATE	691120
SRVY	80
TIME	1200
50.	10.7
100.	10.2
150.	9.3
200.	8.9
228.	8.6
250.	7.5
300.	4.9
350.	2.1
400.	.3
450.	-1.0
490.	-1.9
490.	-2.3
500.	-2.3
550.	-3.4

DATE	691216
SRVY	81
TIME	1200
----	------
[illegible]	10.5
[illegible]	10.3
[illegible]	9.4
[illegible]	9.1
[illegible]	8.8
[illegible]	6.6
[illegible]	4.2
[illegible]	1.8
[illegible]	.5
[illegible]	-.8
[illegible]	-1.6
[illegible]	-2.6
[illegible]	-3.8

DATE	700114
SRVY	82
TIME	1200
----	------
50.	10.6
100.	10.4
150.	9.5
200.	9.0
220.	8.9
250.	6.7
299.	4.3
350.	1.9
400.	.3
450.	-1.0
500.	-2.1
550.	-3.3

DATE	700121
SRVY	83
TIME	1200
----	------
50.	10.8
100.	10.5
150.	9.6
200.	9.2
226.	8.9
240.	7.1
300.	4.6
350.	2.1
400.	.7
450.	-.9
500.	-1.8
546.	-2.9

DATE	700128
SRVY	84
TIME	1200
----	------
50.	10.3
100.	10.4
150.	9.4
200.	9.0
217.	9.0
250.	6.8
300.	4.3
350.	2.0
400.	.6
450.	-1.2
500.	-2.3
550.	-3.0

DATE	700204
SRVY	85
TIME	1200
----	------
50.	10.3
100.	10.4
150.	9.5
200.	9.1
221.	9.0
250.	6.6
300.	3.4
350.	1.4
400.	-.1
450.	-1.6
500.	-2.5

DATE	700211
SRVY	86
TIME	1200
----	------
50.	10.2
100.	10.4
150.	9.5
200.	9.1
221.	9.0
250.	6.7
300.	3.6
350.	1.5
400.	-.2
450.	-1.3
500.	-2.1

DATE	700218
SRVY	87
TIME	1200
----	------
0.	11.7
50.	10.2
100.	10.5
150.	9.2
200.	9.0
235.	8.7
250.	7.5
275.	5.5
300.	4.3
350.	2.3
400.	.4
450.	-.5
500.	-1.0
550.	-2.4

DATE	700225
SRVY	88
TIME	1200
----	------
50.	10.3
100.	10.2
150.	9.3
200.	9.0
228.	9.0
250.	6.9
300.	4.0
350.	2.5
400.	.5
450.	-.3
500.	-2.0
550.	-2.5

DATE	700304
SRVY	89
TIME	1200
----	------
0.	10.7
50.	10.6
100.	10.3
150.	9.5
200.	9.1
220.	8.8
250.	6.6
300.	4.7
350.	2.2
400.	.6
450.	-1.2
500.	-1.8

DATE	700311
SRVY	90
TIME	1200
----	------
50.	10.4
100.	10.3
150.	9.3
200.	9.0
226.	8.7
250.	6.6
278.	5.9
300.	4.7
350.	2.3
400.	.6
450.	-.8
500.	-1.9
550.	-3.9
600.	-4.4

DATE	700318
SRVY	91
TIME	1200
----	------
0.	10.7
50.	10.4
100.	10.3
150.	9.3
200.	9.0
276.	8.7
290.	6.5
300.	4.7
350.	2.5
400.	.6
450.	-.7
500.	-1.8
550.	-3.0

DATE	700918
SRVY	92
TIME	1200
----	------
0.	10.7
50.	10.3
100.	12.2
150.	7.4
200.	8.9
225.	8.7
250.	6.6
300.	4.5
350.	1.9
385.	.3
400.	-.1
450.	-1.9
600.	-2.7

DATE	700826
SRVY	93
TIME	1200
----	------
0.	10.7
50.	10.1
100.	10.1
150.	9.2
200.	8.9
250.	9.4
300.	8.6
313.	8.4
350.	5.9
400.	2.7
450.	.2
485.	-1.1
500.	-1.0
550.	-2.5
666.	-4.7

DATE	701015
SRVY	94
TIME	1200
----	------
50.	10.1
100.	10.0
150.	9.3
200.	9.0
250.	7.4
300.	8.6
326.	8.0
350.	6.2
400.	2.0
450.	.6
500.	-1.3
550.	-3.0
600.	-4.2

DATE	701106
SRVY	95
TIME	1200
----	------
0.	10.7
50.	10.6
100.	10.3
150.	9.5
200.	9.0
250.	7.9
300.	8.4
310.	8.6
350.	5.6
400.	3.5
450.	1.5
500.	-.4
545.	-2.0

DATE	701209
SRVY	96
TIME	1200
----	------
0.	10.6
50.	10.6
100.	10.1
150.	9.2
200.	8.9
250.	7.0
300.	8.6
350.	5.0
400.	2.0
450.	.6
500.	-1.9

DATE	701218
SRVY	97
TIME	1200
----	------
0.	10.7
50.	10.7
100.	10.4
150.	9.6
200.	9.1
250.	8.3
300.	8.4
309.	8.5
350.	6.9
400.	2.2
450.	.9
500.	-.6

DATE	710113
SRVY	98
TIME	1200
----	------
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

DATE	710209
SRVY	99
TIME	1200
----	------
50.	10.7
100.	10.1
150.	9.3
200.	8.9
250.	8.0
300.	6.4
350.	4.3
400.	1.0
450.	-.1
500.	-1.1
550.	-2.5

DATE	710311
SRVY	100
TIME	1200
----	------
50.	10.5
100.	10.0
150.	9.2
200.	8.9
250.	8.0
300.	8.3
307.	8.1
334.	5.3
350.	4.3
400.	2.0
450.	.4
500.	-1.2
550.	-2.2

DATE	710412
SRVY	101
TIME	1200
----	------
0.	10.7
50.	10.1
100.	10.5
150.	9.2
200.	8.8
250.	6.2
285.	8.2
300.	7.2
350.	4.2
400.	3.7
450.	-2.0
450.	-2.6

DATE	710607
SRVY	102
TIME	1200
----	------
50.	10.0
100.	10.2
150.	9.4
200.	8.8
250.	8.3
300.	7.0
350.	5.4
384.	4.4
400.	2.4
450.	-.7
500.	-2.8
550.	-2.6
600.	-3.4

DATE	710816
SRVY	103
TIME	1200
----	------
50.	10.1
100.	10.1
150.	9.2
200.	8.8
250.	8.1
300.	7.2
350.	6.4
400.	1.7
450.	-.8
500.	-2.3

DATE	711004
SRVY	104
TIME	1200
----	------
50.	10.3
100.	10.2
150.	9.3
200.	8.9
250.	8.6
270.	6.2
300.	5.5
350.	3.4
400.	1.6
450.	-.5
500.	-.8
550.	-2.0

DATE	711213
SRVY	105
TIME	1200
----	------
50.	10.7
100.	10.2
150.	9.1
200.	8.9
250.	6.6
263.	6.2
300.	6.5
350.	3.9
400.	1.0
450.	-1.2
500.	-2.5

[illegible]	720110
[illegible]	106
[illegible]	1200
----	------
50.	10.5
100.	10.2
150.	9.2
200.	8.9
250.	8.5
300.	6.4
350.	3.1
400.	1.0
450.	-.5
500.	-1.9

DATE	720214
SRVY	107
TIME	1200
----	------
50.	10.5
100.	10.6
150.	9.2
200.	9.0
250.	8.3
300.	4.8
350.	2.4
400.	.7
450.	-.8
500.	-2.2

DATE	720222
SRVY	108
TIME	1200
----	------
50.	10.4
100.	10.1
150.	9.0
200.	8.8
227.	8.5
250.	6.9
300.	4.4
350.	2.5
400.	1.1
450.	-.1
500.	-1.4

DATE	720410
SRVY	110
TIME	1200
----	------
50.	10.0
100.	10.1
150.	9.1
200.	9.0
220.	8.8
250.	6.4
300.	4.8
331.	3.5
355.	3.9
400.	.2
450.	-2.0

DATE	720821
SRVY	111
TIME	1400
----	------
50.	10.4
100.	10.4
150.	9.1
200.	8.7
250.	7.6
300.	7.1
310.	6.6
350.	2.6
400.	.1
450.	-1.0
500.	-2.2

DATE	721020
SRVY	112
TIME	1000
----	------
50.	10.5
100.	10.7
150.	9.2
200.	8.9
250.	7.5
300.	5.2
350.	3.2
400.	1.4
450.	-.5
475.	-1.6

DATE	721208
SRVY	113
TIME	1400
----	------
50.	10.6
92.	10.7
100.	10.4
150.	9.0
200.	8.8
250.	7.3
300.	4.2
350.	1.8
400.	0.0
450.	-1.0
475.	-2.3

DATE	730105
SRVY	114
TIME	1100
50.	10.8
100.	10.4
150.	9.0
200.	8.9
230.	8.6
250.	7.3
300.	4.6
350.	2.2
400.	.5
450.	-1.2

DATE	730216
SRVY	115
TIME	1000
50.	10.7
100.	10.4
150.	9.6
200.	8.9
223.	8.7
250.	6.8
300.	3.8
350.	1.8
400.	.2
450.	-1.0
495.	-2.9

DATE	730316
SRVY	116
TIME	900
50.	10.4
100.	10.3
150.	9.0
200.	8.9
224.	8.6
250.	6.9
300.	4.9
350.	2.3
400.	0.0
450.	-1.5
475.	-2.0

DATE	730325
SRVY	117
TIME	800
50.	10.7
100.	10.4
150.	9.0
200.	8.9
236.	8.8
250.	7.6
300.	5.0
350.	3.0
400.	1.1
450.	-.4
500.	-2.2

DATE	730405
SRVY	118
TIME	1300
50.	10.6
100.	10.4
150.	8.9
200.	8.9
230.	8.7
250.	7.6
300.	4.4
350.	2.1
400.	.5
450.	-1.4
500.	-3.0

DATE	730418
SRVY	119
TIME	1200
50.	10.7
100.	10.2
150.	9.2
200.	8.8
250.	7.7
300.	4.7
344.	4.2
350.	3.6
400.	.5
450.	-1.8
475.	-3.3

DATE	621024
SRVY	1
TIME	1200
102.	9.0
161.	7.4
221.	6.1
240.	5.8
340.	6.1
385.	1.7
435.	-.1
484.	-2.0

DATE	621101
SRVY	2
TIME	1200
-1.	10.7
18.	10.3
41.	10.7
69.	9.6
118.	8.5
221.	6.1
241.	5.7
339.	6.1
342.	5.2
370.	1.6
435.	-1.1
486.	-1.9

DATE	621109
SRVY	3
TIME	1200
136.	8.0
297.	7.6
277.	6.4
318.	4.6
418.	.3
482.	-1.9
539.	-8.5

DATE	621212
SRVY	4
TIME	1200
33.	10.4
82.	9.3
131.	8.1
188.	7.0
236.	6.6
302.	4.5
359.	2.0
433.	.8
515.	-3.1
567.	-2.1
614.	-2.4
674.	-3.7

DATE	630109
SRVY	5
TIME	1200
-1.	10.5
24.	10.2
50.	10.1
100.	8.9
124.	8.0
150.	7.8
176.	7.0
201.	6.8
225.	6.7
261.	5.8
300.	3.2
326.	2.1
378.	1.5
401.	1.0
426.	.9
451.	.4
480.	0.0
500.	-.5
526.	-1.0

DATE	630116
SRVY	6
TIME	1200
49.	10.1
100.	8.9
150.	7.7
200.	7.0
225.	6.9
250.	6.0
265.	6.0
300.	3.9
325.	2.9
351.	2.2
400.	1.7
450.	.2
482.	0.0
501.	-.4
526.	-1.4

DATE	630122
SRVY	7
TIME	1200
50.	10.1
100.	9.1
150.	7.7
200.	7.0
225.	6.6
251.	6.1
266.	6.0
300.	4.0
325.	2.8
350.	1.4
376.	1.5
401.	1.3
431.	.7
450.	.2
501.	0.0
525.	-.5
551.	-1.4

DATE	630130
SRVY	8
TIME	1200
0.	10.5
50.	10.1
100.	8.8
124.	8.0
150.	7.8
200.	6.9
225.	6.8
275.	5.3
300.	4.3
350.	2.9
400.	1.8
425.	.8
450.	.4
500.	-.1
526.	-1.1

DATE	630205
SRVY	9
TIME	1200
----	------
230.	5.0
275.	3.0
301.	2.0
325.	1.3
400.	.5
451.	-.9

DATE	630213
SRVY	10
TIME	1200
----	------
141.	8.0
150.	6.8
176.	5.8
200.	5.8
227.	5.8
255.	5.1
277.	4.2
300.	3.7
351.	1.9
375.	.7
401.	.7
431.	-.7
451.	-.9

DATE	630221
SRVY	11
TIME	1200
----	------
-1.	8.6
20.	7.3
50.	7.0
99.	6.8
123.	7.4
131.	6.4
142.	6.0
150.	6.8
174.	5.6
201.	5.8
226.	5.8
253.	5.1
277.	3.9
301.	3.4
325.	2.5
350.	1.9
379.	1.2
399.	.3
425.	-.2
450.	-.6
476.	-1.6

DATE	630227
SRVY	12
TIME	1200
----	------
20.	7.3
75.	6.8
110.	6.9
121.	7.8
135.	7.9
174.	5.8
200.	5.8
226.	5.9
250.	5.1
275.	4.0
300.	3.7
351.	1.5
400.	.3
450.	-.9
476.	-1.4

DATE	630307
SRVY	13
TIME	1200
----	------
205.	5.8
225.	5.0
251.	5.1
277.	4.0
300.	3.2
325.	2.0
350.	1.2
401.	0.0
450.	-1.2

DATE	630313
SRVY	14
TIME	1200
----	------
0.	8.6
20.	7.2
50.	6.8
100.	6.6
150.	6.8
175.	5.8
200.	5.6
225.	5.8
250.	5.1
275.	4.3
300.	3.1
326.	1.9
350.	1.3
400.	-.2
451.	-1.2

DATE	630321
SRVY	15
TIME	1200
----	------
176.	5.8
225.	5.0
250.	5.3
274.	4.5
301.	3.2
326.	1.9
351.	1.2
400.	0.0
424.	-.4
450.	-.8

DATE	630402
SRVY	16
TIME	1200
----	------
0.	8.0
6.	8.5
10.	7.9
17.	7.7
50.	6.8
100.	6.6
125.	7.5
150.	7.0
175.	5.9
226.	5.6
250.	5.6
275.	4.8
301.	3.5
351.	1.4
401.	.5
426.	0.0
451.	-.5
475.	-1.2

DATE	630523
SRVY	17
TIME	1200
----	------
-1.	8.8
20.	7.3
50.	6.6
101.	6.7
126.	7.0
151.	6.7
174.	5.7
225.	5.9
250.	5.3
300.	5.4
324.	3.4
350.	1.8
374.	.9
401.	.3
450.	-.8

DATE	630611
SRVY	18
TIME	1200
----	------
0.	8.8
20.	7.4
25.	8.0
49.	6.6
100.	6.6
111.	6.6
119.	8.1
125.	7.1
150.	6.4
175.	5.9
201.	5.5
251.	5.6
276.	5.4
300.	3.9
324.	2.3
401.	.8
451.	-.7

DATE	630626
SRVY	19
TIME	1200
----	------
110.	6.6
120.	7.6
150.	7.1
174.	6.0
200.	5.6
225.	5.8
251.	5.8
276.	5.5
300.	5.0
351.	2.3
376.	1.6
426.	.8
451.	-.6

DATE	630712
SRVY	20
TIME	1200
----	------
-1.	9.0
25.	8.4
50.	6.8
101.	6.7
126.	7.5
153.	6.9
174.	5.8
201.	5.9
227.	5.8
250.	5.5
275.	5.5
301.	4.7
327.	2.8
350.	1.5
375.	.3
401.	-.2
426.	-.9

DATE	630724
SRVY	21
TIME	1200
----	------
-1.	8.9
24.	7.6
50.	6.9
73.	6.5
100.	6.6
125.	7.5
151.	7.3
176.	5.8
201.	5.5
225.	5.8
251.	5.7
274.	5.7
301.	5.9
325.	3.4
351.	2.4
376.	1.4
401.	1.0
425.	.5
450.	-.1
476.	-.5

DATE	630807
SRVY	22
TIME	1200
----	------
0.	9.0
25.	7.5
50.	7.0
75.	6.6
100.	6.6
126.	7.3
151.	6.8
175.	5.8
200.	5.5
226.	5.9
250.	5.8
276.	5.6
300.	6.0
326.	5.0
351.	3.4
375.	1.9
425.	.4
476.	-.5

DATE	630823
SRVY	23
TIME	1200
----	------
0.	9.0
49.	7.0
76.	6.6
100.	6.8
125.	7.3
150.	7.2
175.	6.1
201.	5.7
223.	5.9
250.	5.5
276.	5.9
302.	5.5
350.	2.0
376.	.8
426.	.1
476.	-.7

DATE	630905
SRVY	24
TIME	1200
----	------
126.	7.3
151.	7.3
174.	6.0
201.	5.7
224.	5.9
251.	5.6
270.	5.8
300.	4.8
320.	3.2

DATE	630925
SRVY	25
TIME	1200
25.	7.8
50.	6.7
75.	6.5
100.	6.7
126.	7.3
151.	6.8
176.	5.6
201.	6.4
227.	5.8
277.	3.5
302.	3.4
327.	3.0
378.	.9
403.	-.3
429.	-1.0

DATE	631009
SRVY	26
TIME	1200
-101.	8.3
-77.	8.2
-51.	8.8
0.	8.9
25.	7.5
50.	6.6
76.	6.5
100.	6.9
125.	7.5
151.	6.8
177.	5.8
202.	6.4
251.	4.5
276.	4.8
302.	4.9
327.	2.5
353.	.6
377.	-.6
403.	0.0
428.	-.6
453.	-.1
480.	-.6
504.	-1.9

DATE	631028
SRVY	27
TIME	1200
201.	6.4
227.	6.3
252.	5.0
276.	5.5
302.	4.5
352.	1.4
377.	.4
402.	-.3
428.	-.9

DATE	631114
SRVY	28
TIME	1200
-100.	8.2
-74.	8.2
-51.	8.6
0.	8.8
50.	7.0
77.	6.5
101.	6.6
126.	7.0
176.	6.2
227.	4.5
251.	4.5
277.	4.0
302.	1.9
327.	1.2
353.	-.9
378.	-1.4

DATE	640117
SRVY	30
TIME	1200
0.	7.9
26.	7.9
51.	7.5
77.	6.2
102.	6.3
152.	6.6
179.	6.4
202.	5.8
226.	4.8
252.	4.0
279.	2.9
303.	2.4
337.	1.5
353.	1.1
382.	1.1
403.	.8
453.	-1.0
478.	-2.1

DATE	640214
SRVY	31
TIME	1200
0.	8.0
25.	8.1
50.	7.5
76.	6.0
101.	6.1
152.	6.6
178.	6.3
202.	5.5
227.	5.2
253.	4.8
303.	2.5
353.	1.3
379.	.5
404.	-1.5
429.	-1.7
455.	-1.6
505.	-2.8

DATE	640312
SRVY	32
TIME	1200
0.	8.8
24.	8.0
51.	6.9
74.	6.3
101.	6.1
127.	6.9
151.	6.7
178.	6.6
203.	6.0
278.	4.6
328.	1.9
354.	.8
378.	0.0
404.	-1.5
430.	-1.7
454.	-1.3
480.	-1.8
505.	-1.9
555.	-3.0

DATE	640409
SRVY	33
TIME	1200
0.	9.1
51.	7.3
77.	7.0
102.	7.0
126.	7.2
151.	6.7
201.	6.2
302.	3.0
353.	3.5
403.	.6
454.	-1.8
504.	-3.5
555.	-3.7

DATE	640527
SRVY	34
TIME	1200
0.	6.8
50.	8.4
100.	6.7
151.	6.9
201.	6.3
252.	5.6
302.	4.0
337.	4.5
353.	2.7
403.	.7
453.	-1.9
590.	-3.1

DATE	640624
SRVY	35
TIME	1200
0.	7.9
50.	7.3
100.	6.2
151.	6.8
201.	4.2
252.	5.7
277.	5.9
302.	4.9
353.	2.5
403.	.1
428.	-1.6
454.	-1.5
478.	-1.9
504.	-1.5
529.	-1.8
605.	-2.0

DATE	640831
SRVY	36
TIME	1200
0.	7.3
50.	6.4
100.	5.6
151.	6.1
201.	5.7
252.	5.0
301.	5.3
333.	4.8
352.	2.9
403.	.1
453.	-1.3
503.	-3.4

DATE	640929
SRVY	37
TIME	1200
0.	7.9
50.	9.2
101.	9.0
151.	6.7
201.	5.6
252.	4.0
302.	2.7
353.	1.6
403.	.5
452.	0.0

DATE	641203
SRVY	38
TIME	1200
-1.	8.0
50.	7.3
101.	7.1
151.	6.7
202.	5.7
251.	4.5
302.	3.6
352.	1.8
402.	.8
453.	0.0
503.	-1.3
554.	-1.6
603.	-1.8
655.	-2.0

DATE	650120
SRVY	39
TIME	1200
0.	7.9
50.	7.8
100.	7.1
150.	7.0
201.	5.9
251.	3.9
302.	2.7
352.	1.6
404.	.7
453.	-1.6
504.	-2.5
555.	-1.2
604.	-2.3
658.	-3.8

DATE	650420
SRVY	40
TIME	1200
-50.	8.6
0.	8.0
52.	7.6
101.	7.6
152.	7.2
202.	6.0
252.	5.6
302.	4.4
352.	3.0
403.	1.0
453.	-.5
500.	-2.0
553.	-1.9
604.	-3.0

DATE	650908
SRVY	41
TIME	1200
-51.	8.6
0.	8.3
50.	7.4
101.	7.6
151.	7.5
202.	6.0
252.	5.7
302.	5.8
353.	3.7
403.	1.0
453.	.2
504.	-1.0
554.	-2.0

AD-A101 843 COASTAL ENGINEERING RESEARCH CENTER FORT BELVOIR VA F/G 13/2
BEACH CHANGES AT ATLANTIC CITY, NEW JERSEY (1962-73).(U)
MAR 81 D P MCCANN
UNCLASSIFIED CERC-MR-81-3 NL

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DATE	651020
SRVY	42
TIME	1200
-51.	8.7
0.	8.3
50.	7.6
101.	7.4
151.	6.9
202.	6.2
252.	5.7
302.	6.4
325.	4.1
352.	2.0
403.	1.4
428.	.9
453.	-.1
478.	-.5
503.	-1.4

DATE	651220
SRVY	43
TIME	1800
-51.	8.7
0.	8.0
50.	7.1
101.	7.3
151.	6.9
201.	6.0
251.	5.7
290.	6.1
302.	5.6
352.	4.6
403.	2.9
454.	.6
504.	-1.6
554.	-3.1

DATE	660120
SRVY	44
TIME	1200
50.	7.3
100.	7.2
150.	7.0
201.	6.3
251.	5.3
352.	3.0
402.	2.0
452.	1.0
553.	-.8
603.	-2.1

DATE	660320
SRVY	45
TIME	1800
0.	8.2
50.	7.5
100.	7.0
150.	6.9
201.	6.6
251.	5.9
301.	4.5
339.	4.2
377.	2.3
402.	.8
427.	.4
452.	.6
502.	-1.0
528.	-1.9

DATE	660426
SRVY	46
TIME	1800
0.	8.5
51.	7.8
100.	7.0
151.	7.2
201.	6.6
251.	5.9
302.	5.2
352.	5.0
383.	5.2
402.	3.0
452.	.7
503.	-.8

DATE	661103
SRVY	47
TIME	1200
0.	7.9
50.	7.5
101.	6.9
150.	6.9
201.	6.7
252.	6.5
286.	6.7
325.	5.0
352.	3.6
402.	1.9
451.	-.3
502.	-1.7
552.	-2.1
578.	-2.4

DATE	670110
SRVY	48
TIME	1200
0.	8.3
50.	7.4
100.	6.8
150.	6.9
201.	6.6
251.	6.4
302.	5.6
351.	4.5
401.	2.7
452.	-.6
502.	-.5
552.	-.8
603.	-1.5

DATE	670505
SRVY	49
TIME	1200
0.	8.2
50.	7.0
100.	6.6
151.	6.7
201.	7.1
251.	6.7
301.	4.0
351.	1.9
402.	1.0
452.	1.0
502.	.5
553.	-1.1
603.	-3.4

DATE	670915
SRVY	50
TIME	1200
0.	8.1
50.	7.1
100.	6.7
150.	6.4
200.	6.9
250.	6.9
300.	5.4
349.	5.9
400.	2.3
450.	.9
500.	-.5
600.	-2.9

DATE	670919
SRVY	51
TIME	1800
0.	8.1
50.	7.6
100.	7.0
150.	6.7
200.	6.9
250.	7.0
350.	4.9
401.	2.9
450.	.3
500.	-1.1
550.	-2.3

DATE	671213
SRVY	52
TIME	1200
0.	7.8
50.	7.5
100.	6.7
150.	6.9
200.	7.2
250.	7.3
270.	6.6
300.	4.7
350.	2.7
400.	1.5
450.	.7
500.	0.0
550.	-1.2
600.	-2.8
650.	-1.6
700.	-2.0

DATE	680115
SRVY	53
TIME	1200
99.	6.8
149.	7.0
200.	7.3
250.	7.4
300.	4.5
350.	1.3
400.	.9
450.	0.0
500.	-.9
550.	-1.9

DATE	680124
SRVY	54
TIME	1200
0.	8.0
50.	7.5
100.	6.9
150.	6.9
200.	7.3
250.	7.3
300.	4.7
350.	2.2
400.	1.2
450.	-.2
500.	-.6
550.	-.4
599.	-.9
625.	-2.0

DATE	680130
SRVY	55
TIME	1200
250.	7.4
300.	5.2
350.	1.4
400.	1.2
450.	-.1
500.	-.4
550.	-1.0
600.	-1.3
650.	-1.7
700.	-2.3

DATE	680208
SRVY	56
TIME	1200
-1.	8.0
50.	7.5
100.	6.6
149.	6.0
200.	7.1
250.	7.3
300.	5.0
350.	1.5
400.	1.2
450.	-.4
500.	-.8
550.	-1.4

DATE	680215
SRVY	57
TIME	1200
0.	8.0
50.	7.2
100.	6.7
149.	6.0
199.	7.0
250.	7.1
300.	5.0
351.	1.6
400.	1.6
450.	.3
500.	-1.1
550.	.1
600.	.1
650.	-1.6
700.	-2.5

DATE	680221
SRVY	58
TIME	1200
----	------
-1.	8.1
50.	7.1
100.	6.6
150.	7.0
200.	7.3
250.	7.2
299.	5.1
350.	2.3
399.	1.0
449.	-.3
499.	-1.2
549.	.7
599.	0.0
650.	-1.0
700.	-2.5

DATE	680226
SRVY	59
TIME	1200
----	------
-1.	8.2
50.	7.1
100.	6.6
150.	6.8
200.	7.0
250.	7.1
300.	5.3
350.	1.5
400.	.9
449.	-.5
500.	0.0
549.	-.4
599.	-.9
650.	-1.8
700.	-2.4

DATE	680307
SRVY	60
TIME	1200
----	------
0.	8.3
50.	7.1
100.	6.6
150.	6.8
200.	7.0
251.	7.1
300.	5.0
350.	1.7
400.	1.6
450.	0.0
500.	0.0
550.	.1
600.	-1.0
650.	-1.9

DATE	680313
SRVY	61
TIME	1200
----	------
250.	7.0
300.	5.3
350.	1.7
400.	1.4
451.	.3
500.	0.0
550.	-.4
600.	-1.0
650.	-1.4

DATE	680322
SRVY	62
TIME	1200
----	------
250.	7.0
301.	5.3
350.	1.8
400.	1.4
450.	.3
500.	-.6
550.	-1.0
599.	-.6
650.	-1.5
700.	-2.3

DATE	681007
SRVY	63
TIME	1200
----	------
0.	8.8
50.	6.9
100.	7.0
150.	7.0
200.	7.2
250.	7.0
300.	5.8
350.	5.2
400.	6.1
450.	1.6
500.	0.0
550.	-.4
600.	-.9

DATE	681025
SRVY	64
TIME	1200
----	------
0.	8.8
50.	6.9
100.	7.0
150.	7.0
200.	7.0
250.	7.0
300.	5.8
350.	5.8
400.	4.5
450.	2.3
500.	.6
550.	.5
600.	-.2

DATE	681115
SRVY	65
TIME	1200
----	------
0.	8.4
50.	7.2
100.	7.2
150.	7.5
200.	7.7
250.	6.8
300.	5.1
350.	3.5
400.	2.3
450.	1.2
500.	1.1
550.	.7
600.	-1.2
650.	-2.9

DATE	681220
SRVY	66
TIME	1200
----	------
0.	8.3
50.	6.9
100.	6.8
150.	7.3
200.	7.7
250.	6.9
300.	5.1
350.	4.7
400.	2.8
450.	1.0
500.	.3
550.	-1.8
600.	-1.6

DATE	690113
SRVY	67
TIME	1200
----	------
0.	8.6
50.	6.7
100.	6.9
150.	7.0
200.	7.6
250.	7.0
300.	5.4
350.	4.1
400.	2.9
450.	1.3
500.	.8
550.	-.5

DATE	690122
SRVY	68
TIME	1200
----	------
0.	8.5
50.	6.7
100.	6.8
150.	7.0
200.	7.6
250.	7.3
300.	5.1
350.	3.3
400.	4.0
450.	.6
500.	-.5
550.	-1.8

DATE	690129
SRVY	69
TIME	1200
----	------
0.	8.5
50.	6.6
100.	6.7
150.	6.9
200.	7.6
250.	7.2
300.	5.2
350.	5.1
400.	1.7
450.	.9
500.	-.6
550.	-2.0

DATE	690205
SRVY	70
TIME	1200
----	------
0.	8.6
50.	6.6
100.	6.5
150.	6.7
200.	7.5
250.	7.1
300.	5.2
350.	3.8
400.	2.8
450.	1.2
500.	-1.2
550.	-1.6
600.	-1.0
650.	-2.2
700.	-3.7

DATE	690212
SRVY	71
TIME	1200
----	------
0.	8.6
50.	6.8
100.	6.5
150.	6.7
200.	7.5
250.	7.1
300.	5.3
350.	4.5
400.	3.5
450.	.1
500.	-1.8
550.	-.6
600.	-1.0

DATE	690219
SRVY	72
TIME	1200
----	------
0.	8.6
50.	6.8
100.	6.6
150.	6.8
200.	7.3
250.	7.4
300.	5.1
350.	2.9
400.	1.6
450.	.4
500.	-1.7

DATE	690226
SRVY	73
TIME	1200
----	------
0.	8.6
50.	6.7
100.	6.5
150.	6.8
200.	7.6
250.	7.5
300.	6.9
350.	2.6
400.	1.0
450.	.6
500.	-1.7

DATE	690305
SRVY	74
TIME	1200
0.	8.5
50.	6.7
100.	6.5
150.	6.8
200.	7.5
250.	7.3
300.	3.3
350.	2.3
400.	1.4
450.	0.0
500.	-1.9
550.	-3.0
600.	-3.3
650.	-.6
700.	-2.7
750.	-3.5

DATE	690312
SRVY	75
TIME	1200
0.	8.9
50.	6.6
100.	6.4
150.	6.7
200.	7.8
250.	7.4
300.	4.3
350.	3.0
400.	2.5
450.	-.8
500.	-2.4

DATE	690319
SRVY	76
TIME	1200
0.	8.5
50.	6.4
100.	6.4
150.	6.7
200.	7.3
250.	7.4
300.	4.5
350.	3.7
400.	1.5
450.	-1.8
500.	-2.8

DATE	690527
SRVY	77
TIME	1200
50.	6.3
100.	6.4
150.	6.7
200.	7.2
250.	7.3
300.	5.0
350.	4.3
400.	1.1
450.	1.2
500.	-4.6

DATE	690923
SRVY	78
TIME	1200
0.	8.2
50.	6.7
100.	6.2
150.	6.7
200.	7.4
250.	7.3
300.	6.2
350.	6.6
400.	2.9
450.	1.6
500.	-.3

DATE	691023
SRVY	79
TIME	1200
0.	8.3
50.	6.9
100.	6.2
150.	6.7
200.	7.2
250.	7.3
278.	5.9
300.	6.2
348.	6.0
350.	6.4
400.	3.0
450.	1.6
500.	-.6
550.	-1.2
600.	-1.7
650.	-1.8
700.	-2.6
750.	-4.2

DATE	691120
SRVY	80
TIME	1200
0.	8.4
15.	7.5
50.	6.9
100.	6.3
114.	6.2
150.	6.6
200.	7.3
235.	7.0
250.	7.1
264.	6.8
300.	6.9
330.	5.5
350.	4.8
400.	3.2
440.	1.1
450.	.6
457.	.1
500.	.6
550.	.1
567.	0.0
600.	-.3
650.	-1.3
700.	-2.6

DATE	691216
SRVY	81
TIME	1200
0.	8.6
20.	7.2
50.	6.9
100.	6.3
118.	6.3
130.	7.0
150.	6.7
200.	7.3
250.	7.3
270.	7.3
300.	6.4
350.	5.1
400.	2.8
450.	1.5
500.	.6
550.	0.0
600.	-.8
650.	-1.2
700.	-2.6

DATE	700114
SRVY	82
TIME	1200
50.	8.8
100.	8.0
150.	7.4
200.	7.4
230.	7.4
250.	6.9
300.	3.6
350.	2.6
400.	1.6
450.	-.4
500.	-2.8

DATE	700121
SRVY	83
TIME	1200
50.	8.6
100.	8.0
150.	7.6
200.	7.1
250.	7.3
300.	3.9
335.	4.6
350.	3.4
400.	1.6
450.	.1
500.	-1.9
478.	-3.6

DATE	700128
SRVY	84
TIME	1200
50.	8.4
100.	7.9
150.	7.6
200.	7.2
245.	7.3
250.	7.1
288.	4.6
300.	4.0
350.	3.0
400.	1.2
450.	.4
500.	-1.4
550.	-3.6

DATE	700204
SRVY	85
TIME	1200
50.	8.3
100.	7.9
150.	7.6
200.	7.3
250.	7.2
300.	4.4
350.	2.5
400.	1.1
450.	-.1
500.	-1.3
550.	-2.7

DATE	700211
SRVY	86
TIME	1200
50.	8.2
100.	7.8
150.	7.5
200.	7.2
242.	7.3
250.	6.7
300.	3.6
350.	1.6
400.	.4
450.	-.1
500.	-1.1
550.	-2.7

DATE	700218
SRVY	87
TIME	1200
0.	7.3
50.	8.4
100.	8.0
150.	7.8
200.	7.3
250.	7.3
260.	7.1
275.	5.8
300.	4.4
350.	2.3
400.	.7
450.	-.5
500.	-.7
550.	-2.2

DATE	700225
SRVY	88
TIME	1200
50.	8.3
100.	7.8
150.	7.6
200.	7.2
247.	7.3
250.	7.2
300.	4.1
350.	2.8
400.	.4
450.	.1
500.	-1.1
550.	-3.2

DATE	700304
SRVY	89
TIME	1200
0.	6.6
50.	8.2
100.	7.8
150.	7.6
200.	7.2
251.	7.3
300.	4.6
350.	2.7
400.	1.3
450.	-.2
500.	-1.7

DATE	700311
SRVY	90
TIME	1200
50.	8.1
100.	7.8
150.	7.5
200.	7.1
250.	7.5
300.	4.4
350.	2.2
400.	1.7
450.	.2
500.	-1.8
550.	-4.8

DATE	700318
SRVY	91
TIME	1200
50.	8.7
100.	7.9
150.	7.7
200.	7.2
248.	7.2
300.	4.3
350.	2.8
400.	2.7
422.	2.2
450.	0.0
500.	-2.2
532.	-4.6

DATE	700518
SRVY	92
TIME	1200
50.	8.2
100.	8.0
150.	7.4
200.	7.1
250.	7.4
300.	5.2
350.	2.5
400.	1.0
450.	0.0
500.	-8.1

DATE	700820
SRVY	93
TIME	1200
0.	6.9
50.	8.2
100.	7.9
150.	7.4
200.	7.1
250.	7.0
300.	6.4
342.	6.9
350.	6.2
400.	2.9
450.	-.5
480.	-2.9
513.	-1.7
550.	-1.8
600.	-2.4
650.	-3.3

DATE	701015
SRVY	94
TIME	1200
0.	6.5
50.	8.4
100.	8.4
150.	7.8
200.	7.1
250.	7.1
300.	6.3
339.	6.7
350.	5.2
400.	1.7
450.	.4
500.	-.7
550.	-2.1
600.	-4.2

DATE	701106
SRVY	95
TIME	1200
0.	6.7
50.	8.4
100.	8.4
150.	7.7
200.	7.3
250.	7.4
267.	7.1
300.	5.0
350.	2.8
400.	1.7
450.	1.2
500.	-.7
550.	-2.4

DATE	701209
SRVY	96
TIME	1200
0.	6.7
50.	8.0
100.	9.2
150.	7.4
200.	7.1
250.	7.2
300.	5.4
350.	3.1
400.	.9
450.	-.1
500.	-1.4

DATE	701218
SRVY	97
TIME	1200
0.	7.2
50.	8.6
89.	8.4
95.	8.7
100.	9.3
114.	8.0
150.	7.4
200.	7.3
250.	7.4
255.	7.0
300.	4.8
350.	2.9
400.	1.0
450.	.2

DATE	710113
SRVY	98
TIME	1200
0.	7.3
50.	8.3
100.	8.9
150.	7.3
200.	7.2
245.	7.3
288.	5.0
300.	4.5
332.	4.7
350.	3.9
400.	1.1
450.	-1.3
475.	-2.8

DATE	710209
SRVY	99
TIME	1200
0.	7.8
50.	8.2
100.	8.6
150.	7.2
200.	7.2
250.	7.2
300.	4.6
350.	1.8
400.	.2
450.	-.8
500.	-1.8
525.	-2.1

DATE	710311
SRVY	100
TIME	1200
0.	7.8
50.	7.8
100.	9.1
150.	7.8
200.	7.3
248.	7.3
288.	4.9
300.	4.2
350.	2.6
400.	1.2
450.	0.0
500.	-1.3
550.	-1.8
600.	-3.0

DATE	710412
SRVY	101
TIME	1200
0.	6.6
50.	7.6
100.	8.2
150.	7.4
200.	7.6
225.	7.3
250.	5.5
300.	3.6
350.	1.4
400.	.3
450.	-1.3
500.	-1.8
550.	-1.6
600.	-3.0

DATE	710607
SRVY	102
TIME	1200
0.	6.6
50.	8.2
100.	8.3
150.	7.6
200.	7.3
250.	5.7
290.	5.5
300.	4.0
335.	4.9
350.	3.8
375.	2.0
400.	-.4
450.	-1.4
500.	-.9
550.	-1.7
600.	-3.6

DATE	710816
SRVY	103
TIME	1200
0.	6.6
50.	8.4
100.	8.0
150.	7.8
200.	7.4
250.	6.0
300.	5.7
329.	6.1
350.	4.0
400.	1.1
450.	-.5
500.	-.4
600.	-1.6

DATE	711004
SRVY	104
TIME	1200
0.	6.5
33.	8.2
50.	8.4
100.	8.1
150.	7.3
200.	7.4
236.	6.6
250.	6.5
300.	7.1
329.	7.4
350.	4.9
400.	2.3
450.	-.3
500.	-.2
550.	-1.4
575.	-2.5

DATE	711213
SRVY	105
TIME	1200
0.	7.2
50.	8.7
100.	8.1
150.	7.8
200.	7.3
250.	6.4
300.	7.0
323.	7.1
350.	6.6
400.	3.5
450.	1.9
500.	.3
550.	-1.8
575.	-2.6

DATE	720110
SRVY	106
TIME	1200
0.	7.4
50.	8.6
100.	8.0
150.	7.3
200.	7.1
250.	6.4
300.	6.9
325.	6.9
350.	5.6
400.	3.0
450.	1.1
500.	-.3
550.	-1.5
575.	-2.0

DATE	720214
SRVY	107
TIME	1200
0.	7.6
50.	8.3
100.	8.2
150.	7.8
200.	7.4
250.	7.3
300.	7.3
350.	4.7
400.	2.8
450.	1.4
500.	.1
550.	-.9
575.	-1.2
600.	-1.6

DATE	720222
SRVY	108
TIME	1200
0.	7.1
50.	8.0
100.	7.9
150.	7.2
200.	7.2
250.	7.4
273.	7.2
300.	5.8
350.	3.6
400.	2.2
450.	1.1
500.	.4
550.	-.7
575.	-1.8

DATE	720317
SRVY	109
TIME	1200
0.	8.0
50.	9.3
100.	9.6
150.	8.4
200.	8.2
250.	8.3
277.	8.1
300.	6.7
350.	4.2
400.	2.6
450.	1.3
500.	0.0
550.	-.7

DATE	720410
SRVY	110
TIME	1200
0.	7.4
50.	8.0
100.	8.4
150.	7.3
200.	7.1
250.	7.3
261.	7.0
300.	4.7
350.	2.0
400.	.4
410.	.3
412.	1.7
450.	1.4
500.	-.5
525.	-1.3
550.	-2.3

DATE	720821
SRVY	111
TIME	1500
0.	6.5
25.	7.7
50.	8.5
100.	8.2
150.	7.3
200.	7.0
250.	6.7
300.	6.7
350.	5.3
375.	4.4
400.	1.6
429.	1.6
450.	2.6
500.	2.3
550.	.2
600.	-2.3

DATE	721020
SRVY	112
TIME	1100
0.	7.7
50.	7.5
100.	8.2
150.	7.3
200.	7.4
250.	7.6
300.	7.0
350.	3.0
400.	1.1
450.	-.3
500.	-.6
535.	-1.8

DATE	721208
SRVY	113
TIME	1300
0.	8.3
50.	8.6
100.	7.8
150.	7.3
200.	7.5
250.	7.7
264.	7.5
300.	5.5
350.	3.0
400.	1.3
450.	-.1
500.	-.8
585.	-2.2

DATE	730105
SRVY	114
TIME	1100
0.	8.2
50.	8.0
100.	8.1
150.	7.4
200.	7.7
250.	7.8
300.	4.5
350.	2.0
400.	1.5
450.	.4
500.	-.4
550.	-1.4

DATE	730214
SRVY	115
TIME	1100
0.	8.2
50.	8.0
100.	7.9
150.	7.3
200.	7.2
222.	7.9
224.	7.2
250.	5.5
300.	2.9
350.	1.4
400.	.3
450.	-.5
500.	-1.2

DATE	730316
SRVY	116
TIME	1000
0.	8.0
50.	8.2
100.	7.9
150.	7.3
200.	7.5
225.	7.8
250.	5.7
300.	3.0
350.	1.0
400.	-2.1
450.	-1.6
500.	-2.1

DATE	730325
SRVY	117
TIME	700
0.	8.1
50.	8.2
100.	7.9
150.	7.6
190.	7.7
250.	2.8
300.	0.0
317.	-1.2
340.	.6
350.	.6
400.	.3
450.	-.7
500.	-1.0

DATE	730405
SRVY	118
TIME	1400
0.	8.0
50.	8.1
100.	7.9
150.	7.7
191.	7.6
200.	6.8
250.	3.6
300.	1.5
350.	1.2
400.	.7
450.	-.4
500.	-.9
550.	-3.3

DATE	730418
SRVY	119
TIME	1300
0.	7.9
50.	8.0
100.	7.8
150.	7.4
195.	8.0
250.	3.9
300.	2.4
350.	2.1
400.	1.3
450.	.4
500.	-.8
550.	-2.0

DATE	621024
SRVY	1
TIME	1800
53.	7.3
86.	6.4
132.	6.2
201.	4.8
236.	5.2
285.	5.8
337.	6.2
378.	2.1
421.	-.1
430.	-.6
505.	-2.1

DATE	621101
SRVY	2
TIME	1800
16.	8.0
62.	6.8
136.	5.7
186.	5.0
219.	4.7
270.	5.5
331.	6.6
371.	1.9
424.	-.2
486.	-1.3
531.	-2.6

DATE	621109
SRVY	3
TIME	1200
17.	8.0
86.	6.3
186.	5.3
237.	4.4
293.	3.3
395.	1.6
464.	.4
511.	-8.0

DATE	621212
SRVY	4
TIME	1200
9.	7.7
87.	6.9
121.	7.3
159.	6.4
201.	4.9
273.	2.6
350.	.2
378.	1.1
439.	-.6
479.	-3.6

DATE	630109
SRVY	5
TIME	1200
-1.	8.6
21.	7.3
29.	7.8
50.	7.1
86.	6.9
128.	7.4
140.	6.8
190.	5.5
201.	5.9
220.	6.1
251.	3.6
301.	1.1
350.	-.1
375.	-1.3

DATE	630116
SRVY	6
TIME	1800
21.	7.3
50.	7.0
99.	6.8
126.	7.4
136.	7.3
173.	5.9
191.	5.9
206.	5.8
227.	5.9
251.	4.0
275.	2.9
301.	2.4
326.	1.2
350.	-.5
376.	-1.0

DATE	630122
SRVY	7
TIME	1800
20.	7.4
29.	8.0
50.	7.0
99.	6.8
124.	7.3
132.	6.9
151.	6.5
170.	5.7
193.	5.5
227.	6.2
251.	4.4
297.	2.3
350.	-.2
370.	-1.0

DATE	630130
SRVY	8
TIME	1200
0.	8.6
15.	7.7
20.	7.3
50.	7.0
100.	6.8
120.	7.8
123.	7.4
131.	8.4
141.	8.1
147.	6.5
175.	5.9
190.	5.5
200.	5.7
226.	6.0
232.	6.0
255.	5.2
271.	3.7
300.	2.5
326.	2.4
329.	1.0
350.	.9
401.	0.0
451.	-1.0

DATE	630205
BRVY	9
TIME	1200
49.	10.2
100.	8.9
150.	7.8
201.	7.0
225.	6.9
250.	6.2
276.	5.5
301.	4.4
350.	3.5
375.	2.1
401.	1.6
450.	.5
501.	-1.1

DATE	630213
BRVY	10
TIME	1200
276.	5.3
300.	4.7
350.	3.0
400.	1.0
425.	.8
450.	0.0
501.	-1.0

DATE	630221
BRVY	11
TIME	1200
-1.	10.5
49.	10.1
100.	8.8
124.	8.0
150.	7.8
174.	7.1
200.	7.0
225.	6.8
251.	6.3
302.	4.5
350.	2.9
402.	.9
450.	-.2
476.	-.9
500.	-1.8

DATE	630227
BRVY	12
TIME	1200
74.	9.4
100.	8.8
125.	8.1
150.	7.7
200.	7.0
224.	6.8
249.	6.3
275.	5.5
300.	4.6
325.	4.3
350.	2.8
375.	1.3
400.	.5
425.	.2
450.	-.6
476.	-1.0
501.	-2.0

DATE	630307
BRVY	13
TIME	1200
275.	5.5
300.	5.0
324.	3.7
350.	2.7
375.	1.4
429.	0.0
450.	-.6
500.	-1.3

DATE	630313
BRVY	14
TIME	1200
-1.	10.5
49.	10.0
100.	8.9
150.	7.8
201.	7.0
226.	6.8
251.	6.2
274.	5.5
301.	5.0
351.	2.6
375.	1.5
401.	.7
431.	0.0
451.	-.6
476.	-1.0

DATE	630321
BRVY	15
TIME	1200
100.	8.9
125.	8.0
150.	7.5
200.	6.9
225.	6.8
250.	6.2
275.	5.6
301.	5.2
326.	3.6
351.	2.2
401.	.3
424.	-.5
451.	-1.0

DATE	630402
BRVY	16
TIME	1200
-1.	10.5
6.	10.0
25.	10.1
50.	10.0
100.	8.8
125.	8.3
173.	7.2
201.	6.9
225.	6.8
250.	6.2
275.	5.7
326.	3.8
351.	2.5
401.	.6
426.	.5
475.	-.4
501.	-1.1

DATE	630523
BRVY	17
TIME	1200
100.	8.8
125.	7.5
150.	6.8
200.	6.8
224.	6.6
251.	6.0
276.	5.6
303.	5.8
325.	3.5
350.	1.8
401.	.8
451.	-1.1

DATE	630611
BRVY	18
TIME	1200
0.	10.4
49.	10.0
100.	8.8
150.	7.6
200.	6.7
225.	6.6
250.	6.2
275.	6.2
300.	5.2
325.	3.4
350.	2.3
375.	1.6
400.	1.2
450.	-.2
476.	-1.1

DATE	630626
BRVY	19
TIME	1200
250.	6.2
300.	5.5
350.	3.0
376.	2.3
401.	.8
425.	-.2
450.	-1.1

DATE	630718
BRVY	20
TIME	1200
-1.	10.1
50.	9.8
100.	8.8
150.	7.6
199.	6.9
250.	6.2
275.	6.0
301.	5.3
325.	4.2
351.	1.9
373.	.8
401.	-.3
425.	-1.3

DATE	630724
BRVY	21
TIME	1200
-1.	10.1
49.	10.0
99.	8.9
150.	7.8
200.	6.8
250.	6.2
276.	6.2
300.	5.8
325.	2.9
351.	1.5
379.	.8
400.	.2
425.	-.4
450.	-1.7

DATE	630807
BRVY	22
TIME	1200
0.	10.1
50.	10.0
100.	8.8
150.	7.9
201.	6.9
225.	6.8
251.	6.3
276.	6.0
301.	6.3
325.	4.5
351.	3.2
376.	1.5
401.	.5
423.	-.1
451.	-1.3

DATE	630823
BRVY	23
TIME	1200
49.	10.0
100.	9.0
150.	7.8
202.	6.8
251.	6.3
277.	6.2
301.	6.2
325.	4.7
351.	3.1
377.	1.8
401.	1.0
425.	.4
451.	.2
501.	-.6

DATE	630905
BRVY	24
TIME	1200
100.	8.8
151.	7.5
183.	7.2
223.	6.5
251.	6.3
277.	6.2
301.	5.5
325.	3.8
351.	2.7

DATE	630925
SRVY	25
TIME	1200
-35.	11.1
-3.	11.1
0.	10.6
50.	9.8
101.	8.7
152.	7.4
201.	6.8
252.	6.1
276.	5.7
277.	5.7
303.	4.3
328.	3.4
354.	1.8
379.	1.3
403.	.5
454.	-.7

DATE	631009
SRVY	26
TIME	1800
50.	9.9
101.	8.5
152.	7.6
202.	6.5
227.	6.2
252.	5.4
277.	4.8
302.	2.9
353.	.8
403.	-.4
429.	-1.6

DATE	631028
SRVY	27
TIME	1200
-35.	11.1
-4.	11.1
0.	10.6
25.	9.9
50.	10.0
101.	8.8
151.	7.5
202.	6.8
252.	6.3
302.	3.5
327.	2.0
354.	1.2
403.	-.1
426.	-.6
453.	-1.1

DATE	631114
SRVY	28
TIME	1200
-35.	11.1
-4.	11.1
0.	10.5
25.	9.9
50.	10.3
101.	8.9
151.	8.0
202.	6.8
227.	6.3
277.	4.3
302.	2.9
327.	2.2
352.	1.4
378.	.9
402.	.4
453.	-.6
478.	-1.4

DATE	640117
SRVY	30
TIME	1200
-35.	11.1
-3.	11.1
0.	10.6
50.	9.7
100.	9.0
129.	8.0
175.	7.3
202.	7.0
253.	5.3
281.	3.8
303.	3.0
353.	1.4
378.	.9
404.	.2
454.	-.8
480.	-1.0
504.	-1.6
520.	-2.4

DATE	640214
SRVY	31
TIME	1800
201.	7.1
252.	5.6
303.	2.9
354.	1.0
403.	.2
454.	-.5

DATE	640312
SRVY	32
TIME	1800
0.	10.7
50.	9.7
101.	9.0
129.	8.0
152.	7.8
202.	7.1
252.	5.6
303.	4.8
328.	4.2
353.	2.8
379.	1.7
403.	.9
439.	-.1
479.	-1.8

DATE	640409
SRVY	33
TIME	1200
-1.	10.7
50.	9.7
101.	8.9
151.	7.7
202.	7.0
251.	5.7
302.	4.2
353.	2.5
404.	.9
453.	-.6
504.	-1.8
554.	-2.8
605.	-4.4

DATE	640527
SRVY	34
TIME	1200
0.	10.7
49.	9.7
100.	8.8
151.	7.7
201.	7.1
251.	6.0
302.	4.6
352.	2.8
402.	.8
454.	-.2
503.	-3.1

DATE	640624
SRVY	35
TIME	1800
-1.	10.6
50.	9.7
100.	8.4
151.	7.8
201.	7.0
251.	6.0
302.	4.6
353.	4.5
378.	3.2
403.	1.6
453.	-.8
479.	-1.3

DATE	640831
SRVY	36
TIME	1200
0.	10.6
50.	10.0
101.	8.9
151.	8.0
202.	7.3
252.	6.1
303.	5.7
353.	5.4
368.	5.1
403.	2.9
453.	1.1
504.	.1
554.	-1.8

DATE	640925
SRVY	37
TIME	1200
0.	10.5
50.	9.6
101.	8.7
152.	7.8
202.	7.7
252.	6.2
302.	4.3
353.	3.0
403.	2.0
454.	1.0
503.	.1
529.	-1.0

DATE	641203
SRVY	38
TIME	1200
50.	10.5
100.	9.5
151.	8.6
201.	8.3
252.	6.8
302.	5.9
353.	4.9
403.	4.0
454.	2.2
504.	.3
554.	-1.1
605.	-1.8

DATE	650120
SRVY	39
TIME	1200
50.	11.5
100.	10.5
151.	9.7
201.	8.9
252.	8.4
302.	7.8
353.	5.7
403.	4.3
453.	2.9
504.	1.7
554.	.7
655.	-2.4

DATE	650428
SRVY	40
TIME	1800
0.	11.7
51.	10.4
100.	9.4
151.	8.6
202.	8.3
252.	7.2
302.	6.6
337.	6.7
403.	2.6
453.	1.0
504.	0.0
553.	-1.7

DATE	650908
SRVY	41
TIME	1200
0.	11.7
50.	10.4
100.	9.4
151.	8.7
201.	7.8
252.	6.9
302.	6.4
352.	6.3
403.	4.4
453.	2.1
504.	.4
554.	-.8
604.	-1.4
630.	-1.9

DATE	651029
SRVY	42
TIME	1200
0.	12.2
51.	10.3
100.	9.4
152.	8.7
202.	7.7
252.	6.6
302.	6.4
352.	7.0
377.	4.8
403.	3.2
428.	2.4
454.	1.9
478.	1.4
504.	0.0
544.	-1.5

DATE	651228
SRVY	43
TIME	1200
0.	12.9
50.	10.6
100.	9.3
151.	8.7
202.	7.8
252.	7.6
302.	6.9
349.	6.6
353.	5.6
402.	3.6
454.	3.3
503.	2.4
554.	.1
604.	-1.9
655.	-3.1

DATE	660124
SRVY	44
TIME	1200
50.	10.7
100.	9.7
150.	8.9
200.	8.3
251.	7.6
301.	6.7
351.	5.6
402.	4.7
492.	3.7
553.	.5
603.	-1.1
653.	-1.9

DATE	660329
SRVY	45
TIME	1200
0.	12.5
49.	10.8
100.	9.5
151.	8.8
201.	8.0
251.	7.5
301.	7.1
351.	5.4
402.	3.3
502.	-.4
553.	-1.6

DATE	660426
SRVY	46
TIME	1200
0.	12.5
49.	10.4
100.	9.5
150.	8.8
201.	8.4
251.	7.5
301.	7.3
351.	5.9
402.	3.3

DATE	661103
SRVY	47
TIME	1200
0.	12.6
49.	10.7
100.	9.7
150.	8.8
201.	8.1
251.	7.6
302.	7.3
339.	7.3
402.	2.9
452.	.2
503.	-1.8
553.	-1.2
603.	-1.3

DATE	670118
SRVY	48
TIME	1200
0.	12.5
50.	10.5
100.	9.4
151.	8.7
201.	8.0
251.	7.4
302.	7.4
352.	6.2
403.	5.2
453.	3.4
503.	.8
553.	-1.1

DATE	670303
SRVY	49
TIME	1200
0.	12.5
50.	10.3
101.	9.2
151.	8.7
201.	8.0
252.	7.4
291.	6.1
352.	2.9
402.	.9
453.	-1.3
503.	-3.7

DATE	670919
SRVY	50
TIME	1200
0.	12.5
49.	10.8
100.	9.8
149.	8.7
200.	8.2
250.	7.9
300.	6.8
350.	6.3
400.	5.4
450.	3.3
500.	1.8
550.	.7
601.	-.6
650.	-1.3
700.	-1.8

DATE	670919
SRVY	51
TIME	1200
200.	8.2
250.	8.2
300.	7.6
350.	6.1
400.	4.9
450.	3.7
500.	1.8
550.	-.5
600.	-1.5

DATE	671213
SRVY	52
TIME	1200
0.	12.8
50.	11.4
100.	10.0
150.	9.2
200.	8.1
250.	8.1
300.	7.3
350.	6.2
400.	3.4
450.	2.0
499.	.6
550.	-.5
600.	-2.2

DATE	680115
SRVY	53
TIME	1200
-1.	12.1
49.	11.4
100.	10.0
150.	9.2
200.	9.2
250.	8.3
300.	6.3
350.	4.3
400.	2.7
450.	1.0
499.	-1.2
550.	-4.1

DATE	680124
SRVY	54
TIME	1200
0.	12.1
50.	11.3
100.	9.7
150.	9.2
200.	9.2
249.	8.7
300.	6.4
350.	4.6
400.	3.6
450.	1.6
500.	-1.2
550.	-3.0

DATE	680130
SRVY	55
TIME	1200
200.	9.2
250.	8.7
300.	6.8
350.	3.7
400.	1.6
450.	.3
500.	-2.0
550.	-2.0
599.	-1.6
650.	-2.0

DATE	680208
SRVY	56
TIME	1200
-1.	12.0
49.	11.3
99.	9.7
149.	9.2
200.	9.0
249.	8.3
300.	6.4
350.	4.1
400.	1.9
449.	.3
500.	-.3

DATE	680215
SRVY	57
TIME	1200
-1.	12.0
49.	11.1
100.	9.6
149.	9.0
200.	9.0
250.	8.2
299.	6.9
350.	4.1
400.	1.8
449.	.1
499.	-.1
549.	-.7
600.	-1.9
649.	-2.0
700.	-1.4

DATE	680221
SRVY	58
TIME	1200
-1.	12.1
50.	11.6
100.	9.7
150.	9.0
200.	9.1
250.	8.1
300.	6.8
350.	4.2
399.	2.1
450.	1.4
500.	.5
550.	-1.2
600.	-2.1

DATE	680226
SRVY	59
TIME	1200
50.	11.1
101.	9.6
150.	9.1
201.	9.1
250.	8.2
300.	6.6
350.	4.0
400.	2.1
449.	1.0
500.	0.0
550.	-1.0
599.	-2.2
650.	-2.9

DATE	680307
SRVY	60
TIME	1200
-1.	12.1
49.	11.0
99.	9.9
149.	9.1
200.	9.2
250.	8.2
300.	7.0
350.	4.3
400.	2.4
450.	1.1
500.	0.0
550.	-1.3

DATE	680313
SRVY	61
TIME	1200
199.	9.1
249.	7.9
300.	6.9
350.	4.6
400.	2.8
450.	1.1
499.	0.0
550.	-1.1
600.	-2.4

DATE	680322
SRVY	62
TIME	1200
300.	6.9
350.	4.3
401.	2.0
450.	0.0
500.	0.0
550.	-.8
599.	-1.1
650.	-1.7

DATE	681007
SRVY	63
TIME	1200
0.	12.4
50.	11.2
100.	9.9
150.	9.2
200.	8.3
250.	8.3
300.	7.5
350.	5.4
400.	4.6
450.	3.2
510.	1.1
550.	-.7
600.	-1.7

DATE	681025
SRVY	64
TIME	1200
0.	12.4
50.	11.1
100.	9.9
150.	9.2
200.	8.3
250.	8.2
300.	7.4
350.	6.6
400.	4.4
450.	4.5
500.	1.2
550.	-.3
600.	-1.1

DATE	681115
SRVY	65
TIME	1200
0.	12.4
50.	11.1
100.	9.9
150.	9.1
200.	8.4
250.	8.4
300.	6.4
350.	4.6
400.	3.1
450.	2.0
500.	.9
550.	-.4
600.	-1.4
650.	-1.8

DATE	681220
SRVY	66
TIME	1200
0.	12.3
50.	11.1
100.	10.0
150.	9.1
200.	8.5
250.	8.6
300.	6.6
350.	4.9
400.	3.3
450.	1.6
500.	1.1
550.	-1.8

DATE	690113
SRVY	67
TIME	1200
0.	12.3
50.	10.9
100.	9.9
150.	9.1
200.	8.9
250.	8.6
300.	6.6
350.	4.8
400.	3.3
450.	2.2
500.	1.1
550.	-1.4

DATE	690122
SRVY	68
TIME	1200
0.	12.4
50.	10.9
100.	9.9
150.	9.1
200.	8.5
250.	8.8
300.	6.2
350.	4.2
400.	2.6
450.	1.5
500.	.3
550.	-.9

DATE	690129
SRVY	69
TIME	1200
0.	12.3
50.	10.8
100.	9.9
150.	9.1
200.	8.5
250.	8.7
300.	6.4
350.	4.0
400.	2.7
450.	2.5
500.	1.3
550.	-.4
600.	-1.9

DATE	690205
SRVY	70
TIME	1200
0.	12.3
50.	10.8
100.	9.9
150.	9.2
200.	8.4
250.	8.7
300.	6.4
350.	5.4
400.	3.5
450.	2.1
500.	.5
550.	-.7
600.	-2.4
650.	-3.9

DATE	690212
SRVY	71
TIME	1200
0.	12.3
50.	10.8
100.	9.9
150.	9.2
200.	8.4
250.	8.7
300.	6.6
350.	5.6
400.	3.6
450.	1.5
500.	-.6
550.	-2.7

DATE	690219
SRVY	72
TIME	1200
0.	12.4
50.	10.7
100.	9.9
150.	9.2
200.	8.6
250.	8.8
300.	6.1
350.	3.3
400.	1.7
450.	.6
500.	-.4
550.	-1.9

DATE	690226
SRVY	73
TIME	1200
0.	12.4
50.	10.7
100.	9.9
150.	9.2
200.	8.5
250.	9.4
300.	6.0
350.	3.2
400.	1.3
450.	-.9
500.	-2.4

DATE	690305
SRVY	74
TIME	1200
0.	12.4
50.	10.7
100.	9.8
150.	9.1
200.	8.5
250.	6.5
300.	2.6
350.	-.6
400.	0.0
450.	0.0
500.	-.8
550.	-2.2
600.	-1.9
650.	-2.2
700.	-2.6
750.	-3.6

DATE	690312
SRVY	75
TIME	1200
0.	12.4
50.	10.6
100.	9.9
150.	9.1
200.	8.5
250.	6.5
300.	3.7
350.	1.8
400.	1.1
450.	-.1
500.	-1.8
550.	-2.1

DATE	690319
SRVY	76
TIME	1200
0.	12.4
50.	10.6
100.	9.9
150.	9.1
200.	8.8
230.	8.7
250.	6.5
300.	4.7
350.	2.4
400.	.8
450.	-1.3
500.	-1.9
550.	-1.8

DATE	690527
SRVY	77
TIME	1200
0.	12.7
50.	10.9
100.	10.0
150.	9.2
200.	8.6
250.	5.9
350.	2.3
400.	1.5
500.	-.5
550.	-1.5

DATE	690923
SRVY	78
TIME	1200
50.	10.8
100.	9.9
150.	9.3
200.	8.6
250.	7.7
280.	7.6
300.	6.3
350.	3.4
400.	2.0
450.	1.3
500.	.8
550.	-.7

DATE	691023
SRVY	79
TIME	1200
0.	12.3
50.	10.8
100.	9.8
150.	9.1
200.	8.4
250.	7.7
300.	6.6
350.	3.8
380.	3.6
400.	2.3
450.	.4
500.	-1.3
550.	-2.3
562.	-.9
600.	-1.0
650.	-1.6
700.	-1.8
750.	-2.2
800.	-3.1
825.	-4.2

DATE	691120
SRVY	80
TIME	1200
0.	12.6
20.	10.8
50.	11.1
100.	10.0
150.	9.2
200.	8.5
228.	8.4
250.	7.8
300.	5.9
350.	4.2
400.	2.8
450.	1.5
500.	.6
550.	-1.6
600.	-1.8
650.	-1.2
700.	-1.7
750.	-2.2

DATE	691216
SRVY	81
TIME	1200
0.	12.6
16.	11.2
50.	11.0
100.	10.2
150.	9.2
200.	8.7
232.	8.5
250.	7.6
300.	5.8
350.	4.1
400.	2.7
450.	1.7
483.	1.2
500.	1.2
550.	.3
600.	-.1
650.	-2.6

DATE	700114
SRVY	82
TIME	1200
0.	12.5
23.	10.6
50.	10.8
100.	10.2
150.	9.3
200.	8.8
233.	8.6
250.	8.0
300.	6.0
350.	4.7
400.	3.2
430.	3.1
450.	2.2
470.	1.3
500.	-.5
550.	-2.5

DATE	700121
SRVY	83
TIME	1200
0.	12.6
24.	10.7
50.	10.8
100.	10.1
150.	9.3
200.	8.8
250.	7.8
300.	5.8
333.	5.2
350.	5.0
379.	4.8
400.	3.7
450.	1.0
500.	-1.5
550.	-2.8

DATE	700128
SRVY	84
TIME	1200
0.	12.6
16.	10.8
50.	10.8
100.	10.2
150.	9.3
200.	8.7
225.	8.5
250.	7.7
300.	6.2
323.	5.6
350.	5.4
363.	5.3
400.	3.5
450.	1.4
460.	1.0
500.	-1.2
550.	-2.8

DATE	700204
SRVY	85
TIME	1200
0.	12.7
12.	11.2
50.	10.8
100.	10.3
150.	9.3
200.	8.8
233.	8.6
250.	8.0
300.	5.8
350.	3.9
400.	2.3
450.	1.0
500.	-.2
550.	-1.9
575.	-1.9
588.	-3.0

DATE	700211
SRVY	86
TIME	1200
0.	12.6
23.	10.7
50.	10.7
100.	10.2
150.	9.3
200.	8.8
237.	8.5
250.	8.0
275.	6.5
300.	5.3
350.	3.1
400.	1.5
450.	.3
500.	-.4
550.	-1.2
600.	-1.7
635.	-2.6

DATE	700218
SRVY	87
TIME	1200
0.	12.6
50.	10.7
100.	10.2
150.	9.3
200.	8.7
250.	8.0
280.	6.5
300.	5.5
350.	3.2
400.	1.7
450.	1.0
500.	.1
550.	-2.1

DATE	700225
SRVY	88
TIME	1200
0.	12.6
23.	10.5
50.	10.7
100.	10.2
150.	9.3
200.	8.7
250.	7.9
300.	5.4
400.	2.0
450.	1.6
500.	0.0
550.	-.7
600.	-2.2

DATE	700304
SRVY	89
TIME	1200
0.	12.6
23.	10.7
50.	10.7
100.	11.0
150.	9.3
200.	8.7
250.	8.0
300.	5.3
313.	4.7
337.	5.4
350.	4.6
400.	2.0
450.	.7
500.	-.9

DATE	700311
SRVY	90
TIME	1200
0.	12.6
20.	10.7
50.	10.7
100.	10.3
150.	9.3
200.	8.7
230.	8.8
290.	8.0
300.	6.2
350.	3.4
400.	2.0
450.	.7
500.	-1.0
550.	-1.9
600.	-2.4
650.	-3.2

DATE	700318
SRVY	91
TIME	1200
0.	12.6
20.	10.7
50.	10.7
100.	10.2
150.	9.3
200.	8.7
250.	8.0
300.	6.0
350.	3.7
400.	3.0
450.	.2
500.	-1.2
550.	-1.1

DATE	700518
SRVY	92
TIME	1200
0.	12.6
20.	10.8
50.	10.7
100.	10.1
150.	9.3
200.	8.8
250.	6.8
300.	5.7
350.	3.9
400.	.7
450.	-1.6
500.	-2.2

DATE	700826
SRVY	93
TIME	1200
0.	12.4
20.	10.8
50.	10.7
100.	10.3
150.	9.1
200.	8.5
250.	7.3
300.	5.9
350.	5.1
400.	4.6
450.	3.1
500.	2.0
550.	1.2
600.	-.1
617.	-.8
626.	-1.3
650.	-.3
700.	-1.6
750.	-3.1

DATE	701015
SRVY	94
TIME	1200
0.	11.8
50.	10.9
100.	10.1
150.	8.9
200.	8.4
250.	7.2
300.	5.8
350.	5.1
400.	6.3
414.	6.4
450.	3.5
500.	2.1
550.	.7
565.	.2
600.	-1.3
650.	-2.2
700.	-2.9
735.	-3.7

DATE	701106
SRVY	95
TIME	1200
0.	11.5
4.	10.8
41.	10.5
45.	11.2
50.	10.9
100.	10.3
150.	9.1
200.	8.7
229.	8.2
250.	7.5
300.	6.4
350.	5.4
400.	3.8
450.	3.0
500.	1.4
550.	-.8
583.	-1.4
586.	-2.3

DATE	701209
SRVY	96
TIME	1200
50.	11.0
100.	10.2
150.	9.0
200.	8.5
250.	7.9
300.	6.3
350.	6.5
400.	5.1
450.	2.0
500.	0.0
550.	-.9
600.	-2.0

DATE	701218
SRVY	97
TIME	1200
0.	11.7
21.	10.6
50.	11.1
100.	10.3
150.	9.1
200.	8.7
227.	8.4
250.	7.9
300.	6.1
350.	4.6
371.	3.9
400.	2.9
450.	1.8
500.	.5

DATE	710113
SRVY	98
TIME	1200
0.	11.7
50.	11.0
100.	10.2
150.	9.1
200.	8.6
250.	8.1
300.	6.2
350.	4.8
400.	5.8
450.	2.6
500.	-.5
550.	-1.4

DATE	710209
SRVY	99
TIME	1200
0.	11.9
50.	11.0
100.	10.2
150.	9.2
200.	8.6
250.	8.1
300.	6.8
350.	5.3
400.	2.7
450.	1.2
500.	-.1
550.	-1.5

DATE	710311
SRVY	100
TIME	1200
0.	12.0
10.	10.6
50.	10.7
100.	10.0
150.	9.2
200.	8.7
250.	8.2
300.	6.9
350.	4.9
400.	4.6
450.	2.4
475.	1.6
500.	.4
550.	-2.0

DATE	710412
SRVY	101
TIME	1200
0.	12.1
50.	10.7
100.	9.9
150.	9.1
200.	8.5
250.	8.5
300.	7.6
350.	6.0
400.	5.0
450.	2.9
475.	1.0
500.	-.6
550.	-3.7

DATE	710607
SRVY	102
TIME	1200
0.	11.9
50.	10.7
100.	10.0
150.	9.0
200.	8.5
250.	8.1
300.	7.4
350.	7.3
400.	5.1
450.	2.2
475.	1.0
500.	-.6
550.	-3.7
600.	-4.7

DATE	710816
SRVY	103
TIME	1200
0.	11.2
10.	10.8
50.	10.8
100.	10.0
150.	9.1
200.	8.4
250.	8.1
300.	7.3
350.	7.0
380.	6.0
400.	5.1
425.	3.2
450.	2.1
500.	.4
550.	-.7
575.	-1.5

DATE	711004
SRVY	104
TIME	1200
0.	12.0
50.	11.0
100.	10.0
150.	9.1
200.	8.6
250.	8.4
300.	8.0
350.	6.5
400.	3.6
450.	2.1
500.	-1.1
550.	-2.3

DATE	711213
SRVY	105
TIME	1200
0.	12.2
50.	11.1
100.	10.1
150.	9.0
200.	8.5
250.	8.2
300.	8.0
325.	8.1
350.	5.6
400.	1.9
450.	1.0
500.	0.0
550.	-2.0

DATE	700311
SRVY	90
TIME	1200
0.	12.6
20.	10.7
50.	10.7
100.	10.3
150.	9.3
200.	8.7
230.	8.8
250.	8.0
300.	6.4
350.	3.4
400.	2.0
450.	.7
500.	-1.0
550.	-1.9
600.	-2.4
650.	-3.2

DATE	700318
SRVY	91
TIME	1200
0.	12.6
20.	10.7
50.	10.7
100.	10.2
150.	9.3
200.	8.7
250.	8.0
300.	6.0
350.	3.7
400.	3.0
450.	.2
500.	-1.2
550.	-1.1

DATE	700518
SRVY	92
TIME	1200
0.	12.6
20.	10.8
50.	10.7
100.	10.1
150.	9.3
200.	8.8
250.	9.8
300.	5.7
350.	3.9
400.	.7
450.	-1.8
500.	-2.2

DATE	700826
SRVY	93
TIME	1200
0.	12.4
20.	10.8
50.	10.7
100.	10.3
150.	9.1
200.	8.5
250.	7.3
300.	5.9
350.	5.1
400.	4.6
450.	3.1
500.	2.0
550.	1.2
600.	-.1
617.	-.8
620.	-1.3
650.	-.3
700.	-1.6
750.	-3.1

DATE	701015
SRVY	94
TIME	1200
0.	11.8
50.	10.9
100.	10.1
150.	8.9
200.	8.4
250.	7.2
300.	5.8
350.	5.1
400.	6.3
414.	6.4
450.	3.5
500.	2.1
550.	.7
565.	.2
600.	-1.3
650.	-2.2
700.	-2.9
735.	-3.7

DATE	701106
SRVY	95
TIME	1200
0.	11.5
8.	10.8
41.	10.5
45.	11.2
50.	10.9
100.	10.3
150.	9.1
200.	8.7
229.	8.2
250.	7.5
300.	6.4
350.	5.4
400.	3.8
450.	3.0
500.	1.4
550.	-.8
583.	-1.6
586.	-2.3

DATE	701209
SRVY	96
TIME	1200
50.	11.0
100.	10.2
150.	9.0
200.	8.5
250.	7.9
300.	6.3
350.	6.5
400.	5.1
450.	2.0
500.	0.0
550.	-.9
600.	-2.0

DATE	701218
SRVY	97
TIME	1200
0.	11.7
21.	10.6
50.	11.1
100.	10.3
150.	9.1
200.	8.7
227.	8.4
250.	7.9
300.	6.1
350.	4.6
371.	3.9
400.	2.9
450.	1.8
500.	.5

DATE	710113
SRVY	98
TIME	1200
0.	11.7
50.	11.0
100.	10.4
150.	9.1
200.	8.6
250.	8.1
300.	6.2
350.	4.8
400.	5.8
450.	2.6
500.	-.5
550.	-1.4

DATE	710209
SRVY	99
TIME	1200
0.	11.9
50.	11.0
100.	10.2
150.	9.2
200.	8.4
250.	8.1
300.	6.8
350.	5.3
400.	2.7
450.	1.2
500.	-.1
550.	-1.3

DATE	710311
SRVY	100
TIME	1200
0.	12.0
10.	10.6
50.	10.7
100.	10.0
150.	9.2
200.	8.7
250.	8.2
300.	6.9
350.	4.9
400.	4.4
450.	2.4
475.	1.6
500.	.4
550.	-2.0

DATE	710412
SRVY	101
TIME	1200
0.	12.1
50.	10.7
100.	9.9
150.	9.1
200.	8.5
250.	8.5
300.	7.6
350.	6.0
400.	5.0
450.	2.9
475.	1.0
500.	-.6
550.	-3.7

DATE	710607
SRVY	102
TIME	1200
0.	11.9
50.	10.7
100.	10.0
150.	9.0
200.	8.5
250.	8.1
300.	7.4
350.	7.3
400.	5.1
450.	2.2
475.	1.0
500.	-.6
550.	-3.7
600.	-4.7

DATE	710816
SRVY	103
TIME	1200
0.	11.2
10.	10.8
50.	10.8
100.	10.0
150.	9.1
200.	8.4
250.	8.1
300.	7.3
350.	7.0
380.	6.0
400.	5.1
425.	3.2
450.	2.1
500.	.4
550.	-.7
575.	-1.5

DATE	711004
SRVY	104
TIME	1200
0.	12.0
50.	11.0
100.	10.0
150.	9.1
200.	8.6
250.	8.4
300.	8.0
350.	6.5
400.	3.6
450.	2.1
500.	-1.1
550.	-2.3

DATE	711213
SRVY	105
TIME	1200
0.	12.2
50.	11.1
100.	10.1
150.	9.0
200.	8.5
250.	8.2
300.	8.0
325.	8.1
350.	5.6
400.	1.9
450.	1.0
500.	0.0
550.	-2.0

DATE	720110
SRVY	106
TIME	1200
0.	12.3
50.	11.4
100.	10.0
150.	9.0
200.	8.5
250.	8.3
300.	8.0
325.	7.8
350.	5.3
400.	2.7
450.	1.2
500.	-.2
550.	-2.1

DATE	720214
SRVY	107
TIME	1800
0.	12.2
50.	10.9
100.	10.2
150.	9.0
200.	8.4
250.	8.3
300.	8.2
350.	4.8
400.	2.7
450.	1.2
500.	-.6

DATE	720222
SRVY	108
TIME	1200
0.	12.4
50.	11.0
100.	10.1
150.	9.0
200.	8.6
250.	8.8
300.	6.2
350.	4.0
400.	2.6
450.	1.3
500.	-.7

DATE	720317
SRVY	109
TIME	1200
0.	12.3
50.	11.0
100.	10.1
150.	9.0
200.	8.8
250.	8.8
300.	5.8
350.	3.5
400.	2.3
450.	.7
500.	-2.6

DATE	720410
SRVY	110
TIME	1200
0.	12.4
50.	11.0
100.	10.1
150.	9.1
200.	8.6
250.	8.9
300.	5.8
350.	3.7
400.	2.2
450.	1.6
500.	-.3

DATE	720821
SRVY	111
TIME	1400
0.	12.0
50.	11.0
100.	11.0
150.	9.0
200.	8.6
250.	8.2
300.	6.1
350.	3.4
375.	2.2
400.	1.4
450.	.7
500.	-.8
525.	-2.3

DATE	721020
SRVY	112
TIME	1200
0.	12.4
50.	11.3
100.	10.3
150.	9.2
200.	8.9
250.	8.8
300.	7.2
350.	4.7
400.	2.3
450.	.8
500.	-1.8

DATE	721208
SRVY	113
TIME	1400
0.	12.4
50.	11.0
100.	10.0
150.	9.1
200.	8.7
250.	8.7
300.	6.6
350.	3.7
400.	1.8
450.	.1
500.	-.8

DATE	730105
SRVY	114
TIME	1100
0.	12.3
50.	10.9
100.	9.9
150.	9.0
200.	8.1
250.	7.9
300.	5.0
350.	2.8
400.	1.3
450.	-.1
500.	-2.4

DATE	730216
SRVY	115
TIME	1000
0.	12.3
50.	10.9
100.	10.0
150.	9.1
200.	8.7
250.	7.4
300.	4.1
350.	1.9
400.	.7
450.	-.7
500.	-1.8

DATE	730316
SRVY	116
TIME	900
0.	12.4
50.	10.8
100.	9.9
150.	9.1
200.	8.7
250.	7.7
252.	6.0
300.	3.3
350.	1.4
400.	-.5
450.	-2.1

DATE	730325
SRVY	117
TIME	700
0.	12.4
50.	10.7
100.	9.9
150.	9.1
200.	8.8
250.	5.7
300.	2.4
350.	1.6
400.	1.0
450.	0.8
500.	2.2

DATE	730405
SRVY	118
TIME	1300
0.	12.4
50.	10.7
100.	9.9
150.	9.1
200.	8.7
221.	8.7
223.	8.0
250.	6.4
300.	4.5
350.	2.9
400.	1.7
450.	0.0
500.	-1.6
550.	-1.9

DATE	730418
SRVY	119
TIME	1200
0.	12.4
50.	10.7
100.	9.9
150.	9.0
200.	8.6
220.	8.6
224.	7.9
250.	6.4
300.	4.3
350.	3.0
400.	1.0
450.	-.7
500.	-2.3

DATE	730501
SRVY	120
TIME	1100
0.	12.4
50.	10.7
100.	9.9
150.	9.1
200.	8.7
250.	6.7
300.	4.6
350.	1.5
400.	-.8
450.	-1.5
500.	-3.0

DATE	621024
SRVY	1
TIME	1200
30.	7.2
43.	7.2
120.	7.6
190.	5.6
250.	5.6
300.	5.8
327.	6.0
365.	4.7
407.	2.4
450.	-.4
488.	-2.1

DATE	621101
SRVY	2
TIME	1200
3.	7.4
25.	7.7
65.	7.3
106.	6.8
155.	5.8
212.	5.8
249.	5.3
283.	6.0
331.	5.8
381.	2.7
425.	1.3
486.	-1.9

DATE	621109
SRVY	3
TIME	1200
27.	7.8
84.	7.1
156.	6.1
184.	6.0
237.	6.5
289.	5.0
341.	4.0
406.	.5
473.	-2.0

DATE	621212
SRVY	4
TIME	1200
-22.	9.0
24.	8.0
36.	7.9
86.	6.8
144.	6.0
180.	7.2
201.	6.7
264.	2.9
338.	.3
406.	-.7
472.	-2.3
532.	-3.1

DATE	630109
SRVY	5
TIME	1200
0.	7.5
27.	7.5
75.	7.1
100.	6.7
126.	6.0
150.	5.9
187.	6.6
200.	6.8
226.	5.4
250.	4.1
277.	3.1
350.	.4
374.	-.2
426.	-.3
450.	-.7
476.	-1.5

DATE	630116
SRVY	6
TIME	1200
26.	7.6
101.	6.5
127.	6.3
151.	5.9
177.	6.7
202.	6.6
226.	5.2
250.	4.4
279.	3.1
327.	1.7
351.	1.6
376.	1.3
400.	.3
432.	-.4
451.	-.7
476.	-1.3

DATE	630122
SRVY	7
TIME	1200
100.	6.6
126.	6.0
175.	6.8
201.	5.4
251.	3.4
278.	3.2
301.	2.6
351.	1.1
393.	-.3
426.	-1.6

DATE	630130
SRVY	8
TIME	1200
-1.	7.6
25.	7.5
50.	7.3
74.	7.0
99.	6.5
124.	6.0
149.	5.9
175.	6.4
190.	6.7
200.	6.5
225.	5.4
250.	4.7
301.	3.3
325.	2.4
350.	2.0
400.	.8
450.	-.3
475.	-.5
501.	-1.0

DATE	630205
SRVY	9
TIME	1200
149.	6.0
175.	6.7
200.	6.4
250.	4.5
276.	4.2
301.	3.4
350.	1.8
401.	1.0
420.	.7
475.	-1.0

DATE	630213
SRVY	10
TIME	1200
250.	4.7
275.	4.4
300.	3.9
350.	3.4
400.	1.9
450.	0.0
475.	-1.6

DATE	630221
SRVY	11
TIME	1200
-1.	7.6
50.	7.4
74.	7.1
124.	6.1
150.	6.0
176.	6.6
200.	6.4
251.	5.0
276.	4.3
350.	3.0
401.	2.0
445.	.2

DATE	630227
SRVY	12
TIME	1200
300.	5.8
325.	5.3
360.	4.4
400.	1.5
426.	.6
451.	0.0
476.	-1.1

DATE	630307
SRVY	13
TIME	1200
150.	6.0
175.	6.6
200.	6.2
226.	5.7
250.	4.7
275.	4.3
291.	4.4
300.	4.9
325.	5.0
351.	3.2
375.	1.7
400.	.8
451.	0.0
475.	-1.1

DATE	630313
SRVY	14
TIME	1200
-1.	7.6
24.	7.5
50.	7.2
74.	7.0
100.	6.5
124.	6.0
150.	6.0
190.	6.7
251.	5.0
275.	4.5
300.	5.0
339.	5.1
351.	3.8
375.	2.0
400.	.8
432.	-.1
451.	-.5
474.	-.9

DATE	630321
SRVY	15
TIME	1200
300.	4.9
327.	5.3
338.	5.3
351.	3.9
400.	.9
425.	.2
451.	-.2
475.	-.1
501.	-1.0

DATE	630402
SRVY	16
TIME	1200
191.	6.7
225.	5.4
250.	4.8
275.	4.7
300.	5.4
326.	5.5
350.	3.4
375.	2.2
401.	1.3
426.	.8
475.	-.7
501.	-1.7

DATE	630523
BRVY	17
TIME	1800
25.	8.0
51.	9.4
76.	7.3
99.	6.5
124.	6.0
151.	6.0
174.	6.2
200.	6.0
225.	5.6
251.	4.9
277.	4.7
285.	5.0
325.	5.6
350.	5.5
375.	3.2
402.	1.4
425.	1.1
451.	.5
477.	-.1
501.	-.9
526.	-1.3

DATE	630611
BRVY	18
TIME	1800
0.	6.6
23.	8.1
50.	9.1
75.	7.1
100.	6.4
121.	6.1
151.	6.0
175.	6.4
200.	6.3
250.	5.0
325.	6.0
350.	3.8
377.	2.1
401.	1.2
429.	.4
452.	.4
476.	-.1
501.	-1.4

DATE	630626
BRVY	19
TIME	1200
0.	6.9
25.	7.7
51.	8.1
76.	7.6
125.	6.1
151.	6.1
200.	6.3
226.	5.7
251.	5.0
325.	5.8
351.	4.9
401.	1.7
426.	1.2
461.	0.0
501.	-1.7

DATE	630712
BRVY	20
TIME	1200
-1.	8.6
24.	7.8
50.	8.0
100.	6.5
124.	5.9
151.	6.0
176.	6.0
224.	5.0
250.	5.0
300.	5.9
325.	5.4
350.	2.7
400.	0.0
450.	-1.0

DATE	630728
BRVY	21
TIME	1200
149.	6.0
175.	6.2
200.	6.1
224.	5.3
250.	5.0
300.	6.0
325.	4.9
351.	2.4
400.	.5
428.	0.0
450.	-.5
476.	-.9

DATE	630807
BRVY	22
TIME	1200
0.	6.6
25.	7.8
50.	7.9
77.	7.3
100.	6.4
127.	6.0
150.	6.1
175.	6.4
200.	5.8
224.	5.0
251.	6.1
275.	5.4
301.	6.0
326.	5.5
351.	4.0
374.	2.6
400.	1.3
451.	.3
476.	-.4
501.	-1.0

DATE	630823
BRVY	23
TIME	1200
27.	7.8
50.	8.1
75.	7.4
100.	6.5
125.	6.0
150.	6.1
176.	6.4
200.	5.9
225.	5.0
250.	5.1
275.	5.7
302.	6.0
325.	5.0
351.	3.5
373.	2.6
400.	1.3
450.	.2
477.	0.0
500.	-.7

DATE	630909
BRVY	24
TIME	1200
301.	4.0
351.	2.9

DATE	630925
BRVY	25
TIME	1200
125.	6.0
151.	6.2
175.	6.2
202.	5.4
252.	4.7
277.	4.4
326.	1.7
377.	.8
403.	1.2
428.	.8
453.	-.4

DATE	631009
BRVY	26
TIME	1200
0.	7.3
25.	8.0
51.	8.0
76.	7.9
101.	6.3
126.	6.0
151.	6.3
177.	6.0
201.	5.2
227.	6.0
252.	5.7
303.	3.7
325.	2.6
352.	1.7
370.	.3
403.	0.0
453.	-1.1

DATE	631028
BRVY	27
TIME	1200
25.	7.9
50.	8.4
101.	6.8
126.	6.0
151.	6.0
176.	6.2
226.	5.2
252.	6.3
277.	5.4
302.	4.0
328.	3.7
353.	3.7
377.	1.8
402.	.9
453.	-.9

DATE	631114
BRVY	28
TIME	1200
-23.	8.7
0.	7.3
27.	8.1
50.	8.3
100.	6.5
126.	5.9
151.	6.5
201.	6.8
227.	6.4
302.	1.9
327.	1.3
377.	-.4
403.	-.9
453.	-1.1

DATE	640117
BRVY	30
TIME	1200
0.	7.8
26.	8.1
51.	8.1
76.	7.9
102.	6.7
127.	6.4
177.	7.0
202.	6.8
252.	4.9
281.	3.7
303.	3.0
353.	1.9
380.	1.7
404.	1.3
454.	-.2
479.	-.9
505.	-1.9

DATE	640214
BRVY	31
TIME	1200
0.	7.9
50.	8.0
76.	7.5
101.	6.6
128.	6.5
151.	6.5
176.	6.9
202.	6.8
252.	5.3
277.	4.6
303.	3.3
328.	2.1
378.	.4
403.	0.0
429.	-.2
454.	-.7
479.	-1.3
504.	-1.7
530.	-2.6

DATE	640312
BRVY	32
TIME	1200
0.	7.6
50.	8.5
101.	6.5
151.	6.6
202.	6.7
253.	5.1
304.	3.9
353.	2.2
403.	.5
453.	-.4
504.	-1.0
551.	-1.5

DATE	640409
BRVY	33
TIME	1200
0.	7.6
50.	8.1
101.	6.5
151.	6.2
202.	7.0
252.	5.2
304.	3.9
353.	2.2
404.	.7
454.	-.3
504.	-1.4
555.	-3.2
590.	-4.0

DATE 640527
SRVY 34
TIME 1200

----	------
0.	8.8
50.	8.5
100.	7.5
151.	6.7
201.	6.6
252.	5.8
302.	4.1
353.	3.3
403.	0.0
453.	-1.4
504.	-2.3

DATE 640624
SRVY 35
TIME 1200

----	------
0.	7.9
50.	8.1
101.	7.1
151.	7.7
202.	7.7
252.	5.9
302.	4.1
352.	1.6
378.	1.4
403.	.4
428.	-.6
454.	-.6
504.	-2.4

DATE 640831
SRVY 36
TIME 1200

----	------
0.	8.7
51.	8.3
101.	7.1
151.	6.6
202.	6.8
252.	5.0
302.	4.5
353.	4.5
378.	5.0
403.	2.6
453.	1.0
504.	.2
554.	-1.3
605.	-2.7

DATE 640925
SRVY 37
TIME 1200

----	------
0.	6.6
50.	8.3
101.	7.4
151.	7.3
202.	7.4
249.	7.2
303.	4.5
352.	2.3
404.	1.2
454.	.3
475.	-.1

DATE 641203
SRVY 38
TIME 1200

----	------
50.	8.9
100.	7.8
150.	7.9
201.	7.8
252.	7.4
302.	5.3
353.	3.4
403.	1.2
453.	-.2
503.	-1.7
554.	-1.3
605.	-2.7

DATE 650120
SRVY 39
TIME 1200

----	------
50.	8.5
100.	7.0
151.	7.1
202.	7.2
252.	6.6
303.	3.8
353.	2.3
403.	.8
453.	1.3
554.	-1.3
605.	-2.1
654.	-3.2

DATE 650428
SRVY 40
TIME 1200

----	------
-18.	9.6
0.	6.7
51.	9.0
101.	7.1
151.	6.9
202.	7.1
251.	6.9
303.	4.8
353.	2.8
453.	.5
554.	-1.1
604.	-2.2
694.	-2.2

DATE 650908
SRVY 41
TIME 1200

----	------
-19.	9.6
0.	7.6
50.	7.2
101.	7.8
150.	7.1
201.	6.7
251.	6.7
302.	5.5
342.	5.7
402.	3.1
453.	1.6
503.	.7
554.	-.2
604.	-2.0

DATE 651029
SRVY 42
TIME 1200

----	------
-19.	9.5
0.	8.0
50.	9.0
101.	8.1
151.	7.5
202.	7.4
252.	7.4
302.	6.3
353.	6.6
403.	3.5
428.	2.5
454.	2.3
479.	2.4
504.	1.8
530.	.7
554.	0.0
580.	-1.3

DATE 651220
SRVY 43
TIME 1200

----	------
-18.	9.5
0.	6.5
50.	8.6
101.	7.9
152.	7.0
202.	6.8
252.	6.9
302.	5.7
347.	5.7
403.	2.7
453.	1.0
504.	0.0
554.	-.3
604.	-1.3
655.	-2.0

DATE 660124
SRVY 44
TIME 1200

----	------
50.	8.3
100.	8.0
151.	7.5
201.	7.4
252.	6.3
302.	5.1
352.	4.1
402.	2.5
452.	1.0
503.	0.0
553.	-.4
604.	-1.1
654.	-2.5

DATE 660329
SRVY 45
TIME 1200

----	------
0.	6.6
50.	9.1
100.	7.8
150.	7.1
201.	7.3
251.	6.6
301.	5.0
352.	4.0
392.	4.9
428.	2.0
453.	1.0
478.	.5
503.	.3
528.	-.6
553.	-1.7

DATE 660426
SRVY 46
TIME 1200

----	------
50.	9.1
100.	8.4
151.	7.9
201.	8.0
252.	7.0
302.	6.4
341.	6.3
352.	4.4
402.	1.1
452.	-.4
502.	-.9

DATE 661103
SRVY 47
TIME 1200

----	------
0.	6.8
50.	9.1
100.	8.4
150.	7.0
201.	7.2
251.	6.7
302.	6.4
352.	4.4
402.	2.7
452.	1.3
502.	-.1
553.	-2.4

DATE 670118
SRVY 48
TIME 1200

----	------
0.	8.3
50.	9.5
151.	7.0
201.	7.4
252.	6.7
301.	5.9
352.	3.2
453.	-.3
503.	-1.0

DATE 670503
SRVY 49
TIME 1200

----	------
0.	8.6
51.	9.8
101.	8.8
151.	8.0
201.	8.2
222.	7.6
252.	5.7
302.	3.4
352.	2.6
402.	2.1
452.	1.2
503.	0.0
553.	-2.0

DATE	670915
SRVY	50
TIME	1200
0.	6.7
50.	9.4
100.	8.4
150.	7.2
200.	7.0
250.	5.7
300.	3.4
350.	5.8
401.	2.8
450.	.7
501.	-.6
551.	0.0
650.	-1.6
701.	-2.3

DATE	670919
SRVY	51
TIME	1200
0.	6.4
50.	9.2
100.	8.5
150.	6.9
200.	7.3
250.	6.2
300.	4.4
350.	2.8
401.	1.2
450.	.5
500.	-1.0
550.	-1.8

DATE	671215
SRVY	52
TIME	1200
0.	8.6
50.	9.3
101.	8.1
150.	7.1
200.	7.2
250.	6.8
285.	5.6
300.	4.5
350.	2.5
401.	1.4
450.	.6
500.	0.0
550.	-2.4

DATE	680115
SRVY	53
TIME	1200
-1.	9.5
49.	9.9
99.	9.2
149.	8.2
200.	8.0
250.	8.0
350.	4.7
400.	5.3
450.	2.4
499.	.9
550.	-.8
600.	-2.0

DATE	680124
SRVY	54
TIME	1200
0.	9.6
50.	9.9
100.	9.0
150.	8.0
200.	8.2
251.	8.0
300.	5.9
351.	4.7
400.	5.4
450.	1.3
500.	-.4
524.	-1.2

DATE	680130
SRVY	55
TIME	1200
-1.	9.5
50.	9.8
100.	9.0
150.	8.2
200.	8.2
250.	7.9
300.	6.4
335.	6.2
400.	2.7
450.	1.8
500.	-.1
550.	-2.5

DATE	680208
SRVY	56
TIME	1200
0.	9.4
50.	9.8
100.	8.9
150.	7.9
200.	8.2
250.	7.9
300.	5.9
351.	3.8
400.	2.2
450.	.8
476.	0.0

DATE	680215
SRVY	57
TIME	1200
0.	9.1
50.	9.7
100.	8.8
150.	7.8
200.	8.8
251.	7.8
301.	6.2
351.	4.3
400.	2.7
451.	.6
500.	-1.1
550.	-3.3

DATE	680221
SRVY	58
TIME	1200
0.	9.1
50.	9.6
100.	8.8
149.	7.8
201.	7.9
250.	7.7
300.	6.2
350.	4.5
400.	2.1
450.	.6
499.	-.8
530.	-2.5

DATE	680226
SRVY	59
TIME	1200
-1.	9.4
50.	9.9
99.	9.6
150.	7.7
200.	7.9
250.	7.7
300.	6.0
350.	3.4
400.	1.9
450.	.5
500.	-.6
530.	-2.5

DATE	680307
SRVY	60
TIME	1200
0.	9.5
50.	9.7
100.	8.9
150.	7.8
200.	7.9
250.	7.7
300.	6.0
350.	4.5
400.	1.9
450.	0.0
500.	0.0

DATE	680313
SRVY	61
TIME	1200
200.	7.9
250.	7.7
300.	4.9
351.	2.7
401.	.7
450.	0.0
500.	-.4
525.	-2.9

DATE	680322
SRVY	62
TIME	1200
0.	10.0
50.	10.3
102.	8.6
150.	7.8
200.	7.9
250.	7.8
260.	7.8
300.	3.9
350.	2.0
400.	1.7
450.	.9
525.	-1.1

DATE	681007
SRVY	63
TIME	1200
0.	5.9
50.	9.0
100.	8.6
150.	7.7
200.	7.4
250.	7.1
300.	5.4
350.	6.6
375.	3.8
400.	2.4
450.	.8
500.	-1.7
600.	-3.9

DATE	681025
SRVY	64
TIME	1200
0.	5.8
25.	8.1
50.	9.0
100.	8.6
150.	7.6
200.	7.4
250.	7.0
300.	6.2
320.	6.3
350.	4.1
375.	2.8
400.	1.9
425.	1.2
475.	.1
525.	-1.0

DATE	681115
SRVY	65
TIME	1200
0.	6.5
50.	8.3
100.	8.4
150.	7.7
200.	7.6
250.	5.9
300.	4.3
350.	2.8
400.	2.0
430.	2.0
450.	1.0
500.	-1.1
550.	-3.1

DATE	681220
SRVY	66
TIME	1200
0.	7.1
50.	8.3
100.	8.3
150.	7.8
200.	7.7
250.	6.0
300.	4.4
350.	3.0
400.	2.5
450.	.8
500.	-2.5
550.	-2.5
600.	-2.2
650.	-3.0
675.	-3.7

DATE	690113
SRVY	67
TIME	1200
0.	7.0
50.	8.2
100.	8.2
150.	7.9
200.	7.4
250.	6.6
300.	5.2
350.	4.8
400.	3.4
450.	-.2
500.	-2.6
550.	-2.6
600.	-2.7
625.	-3.1

DATE	690122
SRVY	68
TIME	1200
0.	7.0
50.	8.2
100.	8.2
150.	7.6
200.	7.6
250.	6.0
300.	3.7
350.	2.0
400.	.2
450.	-1.1
500.	-2.2

DATE	690129
SRVY	69
TIME	1200
0.	7.1
50.	8.2
100.	8.3
150.	7.7
200.	7.6
250.	6.1
300.	3.3
330.	2.6
350.	1.5
400.	-.5
450.	-.3
500.	-.5
550.	-1.7
600.	-3.0

DATE	690205
SRVY	70
TIME	1200
0.	7.0
50.	7.8
100.	8.0
150.	7.7
200.	7.8
250.	6.1
300.	3.8
330.	2.5
350.	1.1
400.	-.2
450.	.3
500.	-.6
550.	-2.0
600.	-3.3
650.	-4.7

DATE	690212
SRVY	71
TIME	1200
0.	6.9
50.	7.8
100.	8.0
150.	7.5
200.	7.7
250.	6.5
300.	4.3
325.	3.1
350.	1.5
400.	.8
450.	.4
500.	-.5
550.	-1.9
575.	-2.4

DATE	690219
SRVY	72
TIME	1200
0.	6.9
50.	8.0
100.	8.1
150.	7.5
200.	7.6
250.	6.0
300.	3.2
350.	1.6
400.	.5
450.	-.2
500.	-.5
550.	-2.5

DATE	690226
SRVY	73
TIME	1200
0.	6.3
50.	7.8
100.	8.1
150.	7.5
200.	7.6
220.	7.6
250.	5.4
280.	3.6
300.	2.8
350.	.8
400.	-.8
450.	-.8
500.	-1.7
525.	-2.7

DATE	690305
SRVY	74
TIME	1200
0.	6.8
50.	7.8
100.	8.1
150.	7.7
188.	8.0
200.	6.7
250.	3.5
295.	1.8
350.	.6
400.	1.1
450.	-.7
500.	-2.8
550.	-4.4

DATE	690312
SRVY	75
TIME	1200
0.	6.8
50.	7.9
100.	8.1
150.	7.6
200.	6.6
225.	5.0
250.	3.8
300.	2.2
350.	2.6
400.	.7
450.	-1.9
500.	-3.2

DATE	690319
SRVY	76
TIME	1200
0.	6.9
50.	7.8
100.	8.0
150.	7.5
200.	6.3
225.	4.8
250.	3.7
275.	4.7
300.	4.3
350.	1.7
400.	.7
450.	-1.6
485.	-2.7

DATE	690527
SRVY	77
TIME	1200
50.	7.7
100.	8.3
150.	7.9
200.	7.5
250.	6.4
300.	5.4
350.	5.5
400.	4.3
450.	2.3
500.	.8
550.	-1.6
600.	-2.6

DATE	690923
SRVY	78
TIME	1200
50.	9.0
100.	8.6
150.	7.3
200.	6.9
250.	5.6
300.	6.3
350.	4.7
400.	1.3
450.	-.5
500.	-2.1

DATE	691023
SRVY	79
TIME	1200
50.	9.0
100.	8.1
150.	7.3
200.	6.4
250.	6.5
280.	6.9
300.	4.9
350.	1.4
400.	.9
450.	.7
500.	-.2
550.	-2.7
600.	-4.8

DATE	691120
SRVY	80
TIME	1200
50.	9.0
100.	8.1
150.	7.4
200.	7.0
250.	7.0
286.	5.2
300.	4.7
350.	3.2
400.	1.7
450.	.4
500.	-1.7
550.	-4.3

DATE	691216
SRVY	81
TIME	1200
50.	9.1
100.	8.3
150.	7.5
200.	7.3
250.	7.4
300.	4.8
350.	3.2
400.	2.8
450.	.3
500.	-1.9
550.	-4.3

DATE	700114
BRVY	82
TIME	1200
0.	8.4
25.	7.3
50.	6.8
100.	6.4
110.	6.0
115.	6.4
150.	6.7
200.	7.1
250.	7.4
300.	6.4
350.	5.9
370.	3.3
388.	4.0
400.	3.4
450.	1.5
500.	0.0
550.	.0
600.	-.4
650.	-2.2

DATE	700121
BRVY	83
TIME	1200
0.	8.5
9.	7.9
50.	6.8
100.	6.5
119.	6.0
120.	6.2
150.	6.7
200.	7.1
250.	7.5
300.	6.2
350.	4.0
365.	5.5
387.	4.1
400.	3.2
450.	1.0
500.	.8
550.	.4
600.	-.8
650.	-2.4

DATE	700128
BRVY	84
TIME	1200
0.	8.4
12.	7.8
50.	6.8
100.	6.3
117.	6.0
150.	6.6
200.	7.1
243.	7.8
250.	7.4
300.	6.2
350.	4.1
388.	4.1
400.	3.5
450.	1.5
500.	.6
550.	-.6
600.	-1.5
614.	-1.7
627.	-.8
650.	-1.5
700.	-3.2

DATE	700204
BRVY	85
TIME	1200
0.	8.4
10.	7.8
50.	6.9
100.	6.9
119.	6.1
150.	6.7
200.	7.1
250.	7.8
288.	6.6
300.	5.8
350.	3.9
400.	2.7
450.	1.4
500.	.2
533.	-.2
550.	-.3
600.	-1.1
650.	-2.1
700.	-2.8

DATE	700211
BRVY	86
TIME	1200
0.	8.4
25.	7.3
50.	6.8
100.	6.3
116.	6.0
150.	6.6
200.	7.0
250.	7.6
300.	6.3
350.	4.1
400.	2.7
450.	1.1
490.	-.2
500.	-.4
525.	-.9
550.	.1
600.	.2
650.	-.7
695.	-2.1

DATE	700218
BRVY	87
TIME	1200
0.	8.4
50.	6.8
100.	6.3
150.	6.6
200.	7.1
250.	7.6
300.	6.3
350.	4.4
375.	4.1
400.	2.8
450.	1.2
500.	-.1
550.	-.3
600.	-1.6

DATE	700225
BRVY	88
TIME	1200
0.	8.4
50.	6.8
100.	6.2
150.	6.4
200.	7.0
250.	6.2
300.	6.8
350.	5.0
400.	2.5
450.	1.9

DATE	700304
BRVY	89
TIME	1200
0.	8.4
50.	6.8
100.	6.2
150.	6.5
200.	7.0
250.	7.6
300.	6.4
350.	4.5
400.	3.1
450.	1.1
500.	.9

DATE	700311
BRVY	90
TIME	1200
0.	8.3
22.	6.8
50.	6.8
100.	6.3
120.	6.1
150.	6.5
200.	7.0
250.	7.0
300.	6.4
350.	5.4
400.	3.3
450.	1.7
500.	-.8
535.	-1.2
550.	-.8
600.	-.2
617.	-.4
650.	-.9
700.	-2.0
750.	-3.1

DATE	700318
BRVY	91
TIME	1200
0.	8.4
15.	6.8
50.	6.8
100.	6.3
150.	6.6
200.	7.1
250.	7.6
300.	6.5
350.	5.5
400.	3.6
450.	1.8
500.	-.6
550.	-2.2
600.	-.9
650.	-2.9

DATE	700518
BRVY	92
TIME	1200
0.	8.3
15.	6.7
50.	6.8
100.	6.8
150.	6.5
200.	7.0
250.	7.7
300.	6.6
350.	5.1
400.	4.5
450.	1.1
500.	-.3
550.	-.5
600.	-1.0
645.	-1.8
655.	-.4
665.	-2.0

DATE	700826
BRVY	93
TIME	1200
0.	8.5
5.	7.5
25.	6.5
50.	6.3
100.	6.0
150.	6.5
200.	6.8
250.	7.5
300.	6.3
350.	5.9
370.	5.4
400.	4.2
450.	2.3
500.	1.1
550.	-.1
578.	-.7
585.	-1.2
594.	-.8
600.	-.7
650.	-1.8
700.	-3.5

DATE	701015
BRVY	94
TIME	1200
0.	8.7
50.	6.2
100.	6.0
150.	6.6
200.	6.9
250.	7.4
300.	6.3
350.	5.8
400.	6.1
425.	6.4
450.	3.7
500.	.4
520.	-.8
550.	-2.2
600.	-1.6
650.	-2.8
700.	-4.3

DATE	701106
BRVY	95
TIME	1200
0.	8.4
15.	6.7
50.	6.3
100.	6.2
114.	5.8
131.	6.7
150.	6.7
200.	7.0
250.	7.4
300.	6.7
350.	5.9
400.	5.3
450.	2.5
480.	.7
500.	-.8
550.	-3.4

DATE	701209
BRVY	96
TIME	1200
0.	8.2
50.	6.2
150.	6.6
200.	6.8
250.	7.4
300.	6.2
350.	6.5
400.	7.0
450.	0.8
500.	-1.5
550.	-.6

DATE	701210
BRVY	97
TIME	1200
0.	8.4
20.	6.4
50.	6.2
100.	6.0
150.	6.4
200.	7.1
250.	7.4
300.	7.4
310.	7.4
350.	5.0
400.	3.0
410.	2.4
450.	1.2
500.	.6
550.	-1.6

DATE	710113
BRVY	98
TIME	1200
0.	8.3
50.	6.2
100.	6.0
150.	6.4
200.	6.9
250.	7.7
300.	7.3
314.	7.1
350.	5.0
379.	5.0
400.	1.7
450.	.3
500.	-1.1
550.	0.8
600.	-.2

DATE	710209
BRVY	99
TIME	1200
0.	4.3
13.	6.7
50.	6.0
100.	5.6
150.	6.6
200.	6.8
250.	7.8
300.	7.4
317.	6.9
350.	4.9
400.	2.7
450.	1.1
500.	0.0
550.	-1.9
565.	-2.2
569.	-1.4
600.	-1.6

DATE	710311
BRVY	100
TIME	1200
0.	8.3
6.	6.6
50.	5.8
100.	5.5
150.	6.2
200.	6.7
250.	7.7
300.	7.4
350.	4.5
400.	2.7
450.	2.0
500.	.1
550.	-1.9
570.	-2.9
600.	-1.3

DATE	710412
BRVY	101
TIME	1200
0.	8.1
10.	6.6
50.	6.0
100.	5.9
150.	6.3
200.	6.9
250.	8.0
300.	6.1
350.	3.7
400.	2.1
450.	.9
500.	.6
525.	0.0
550.	-1.8
600.	-2.8

DATE	710607
BRVY	102
TIME	1200
0.	8.7
50.	5.5
100.	5.3
150.	6.0
200.	6.6
250.	7.2
300.	6.0
345.	6.0
350.	5.8
375.	4.2
400.	3.0
450.	1.5
500.	-.2
550.	-2.4
600.	-4.0

DATE	710816
BRVY	103
TIME	1200
0.	7.9
13.	6.2
50.	5.9
100.	5.7
150.	5.7
200.	6.9
250.	7.1
300.	6.1
350.	5.8
380.	6.0
400.	5.1
450.	2.0
500.	.4
550.	-.3
600.	-1.6
650.	-3.1

DATE	711004
BRVY	104
TIME	1200
0.	7.8
50.	6.1
100.	5.8
150.	6.2
200.	6.9
250.	7.8
300.	6.8
350.	6.2
400.	3.1
450.	1.7
500.	.3
550.	-.7
600.	-2.0

DATE	711213
BRVY	105
TIME	1200
0.	8.0
50.	6.1
100.	6.0
150.	6.2
200.	7.0
250.	7.7
300.	7.0
350.	7.4
400.	4.0
450.	.5
500.	-1.0
550.	-.8

DATE	720110
SRVY	106
TIME	1200
0.	8.1
50.	6.1
100.	6.0
150.	6.2
200.	6.6
250.	7.5
300.	6.9
350.	7.1
400.	3.3
450.	1.6
500.	0.0
550.	-1.4

DATE	720214
SRVY	107
TIME	1200
0.	8.0
50.	6.2
100.	6.0
150.	6.2
200.	6.9
250.	7.0
300.	6.5
350.	3.3
400.	2.1
450.	.7
500.	-.6
550.	-1.2

DATE	720222
SRVY	108
TIME	1200
0.	8.0
50.	6.2
100.	6.0
150.	6.2
200.	7.1
250.	7.7
300.	4.9
350.	3.3
400.	2.1
450.	.7
500.	-1.3

DATE	720317
SRVY	109
TIME	1200
0.	7.8
50.	6.2
100.	6.0
150.	6.2
200.	7.1
250.	7.7
300.	5.2
350.	3.2
400.	1.6
450.	.5
500.	-.8

DATE	720410
SRVY	110
TIME	1200
0.	7.7
50.	6.2
100.	6.0
150.	6.1
200.	7.1
250.	7.6
300.	5.2
350.	3.3
400.	1.7
450.	.6
500.	0.0
550.	-1.8

DATE	720821
SRVY	111
TIME	1500
0.	7.8
50.	6.1
100.	6.0
150.	6.1
200.	7.1
250.	7.0
300.	5.4
350.	6.0
380.	6.0
400.	4.8
450.	1.3
500.	0.0
550.	-1.0
575.	-2.7

DATE	721020
SRVY	112
TIME	1100
0.	7.2
50.	7.3
100.	7.0
150.	6.5
200.	7.3
250.	7.6
300.	7.8
325.	8.0
350.	6.7
400.	2.0
425.	0.0
450.	-.1
500.	0.0
550.	0.0
600.	-1.9

DATE	721208
SRVY	113
TIME	1500
0.	7.2
50.	7.1
100.	7.1
150.	6.3
200.	7.2
250.	7.4
300.	7.9
350.	6.8
400.	3.2
425.	2.1
450.	1.2
500.	.5
550.	-.1

DATE	730105
SRVY	114
TIME	1100
0.	7.2
50.	6.9
100.	6.6
150.	6.2
200.	7.3
250.	7.3
300.	7.8
350.	5.5
400.	3.3
450.	1.6
475.	-.3

DATE	730216
SRVY	115
TIME	1100
0.	7.5
50.	6.9
100.	6.1
150.	6.3
200.	7.4
250.	7.4
300.	7.7
350.	4.9
400.	2.4
450.	1.3
500.	.4
550.	-1.4

DATE	730316
SRVY	116
TIME	1000
0.	7.6
50.	6.8
100.	6.3
150.	6.3
200.	7.3
250.	7.4
300.	7.6
350.	5.3
400.	3.2
450.	.9
500.	1.6
550.	.1
600.	-1.9

DATE	730325
SRVY	117
TIME	600
0.	7.1
50.	6.5
100.	6.1
150.	6.4
200.	7.4
250.	7.4
300.	7.6
350.	4.9
400.	4.5
450.	1.2

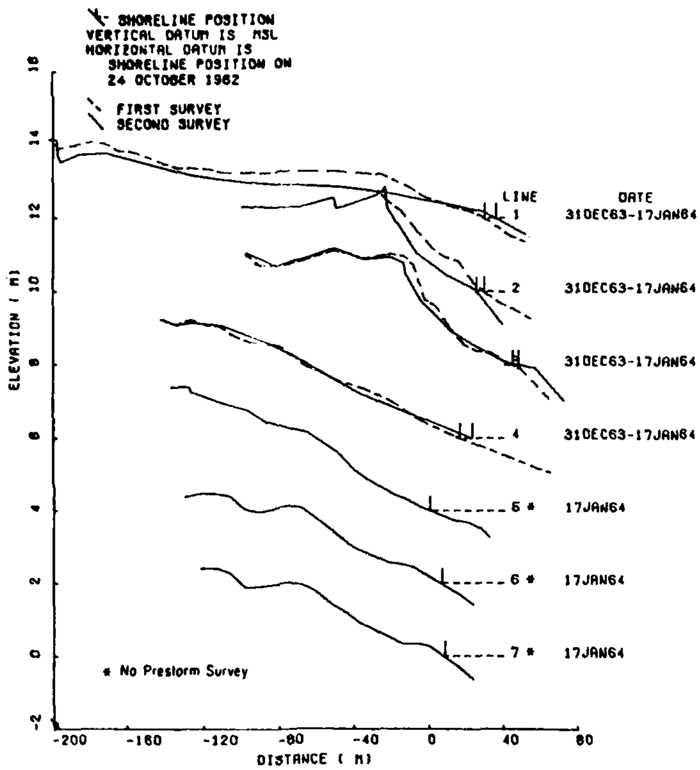
DATE	730405
SRVY	118
TIME	1400
0.	7.2
50.	6.6
100.	6.3
150.	6.4
200.	7.3
250.	7.4
300.	7.6
315.	7.4
350.	5.1
400.	2.7
450.	.7
480.	-.7
500.	-1.8

DATE	730418
SRVY	119
TIME	1300
0.	7.1
50.	6.6
100.	6.1
150.	6.3
200.	7.3
250.	7.3
300.	7.7
350.	4.6
400.	4.2
450.	1.5
500.	-1.9
550.	-2.4
558.	-2.3
562.	-.8
565.	.4
600.	.9
650.	.8
700.	0.0
750.	-1.1
775.	-1.8

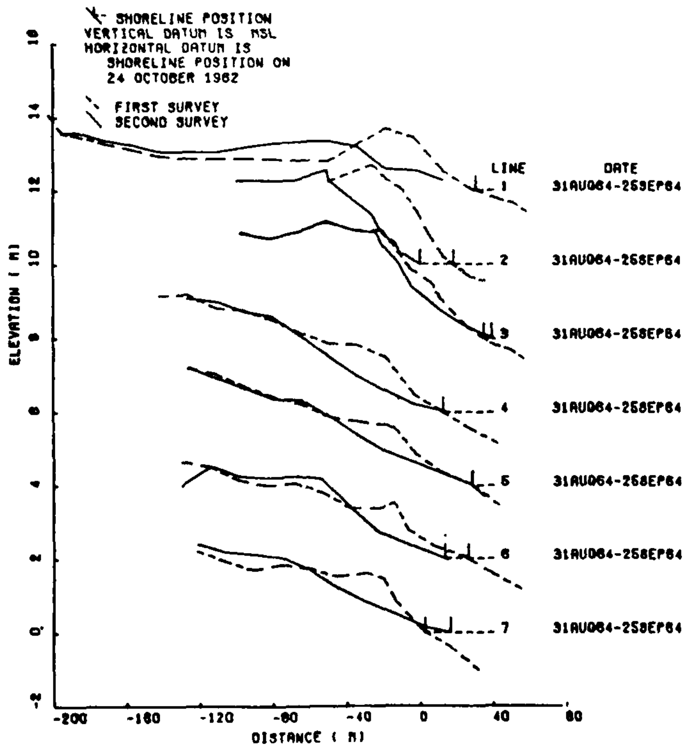
DATE	730501
SRVY	120
TIME	1100
0.	7.0
50.	6.5
100.	6.2
150.	6.3
200.	7.2
250.	7.2
300.	7.7
350.	5.2
400.	4.5
450.	1.1

APPENDIX C

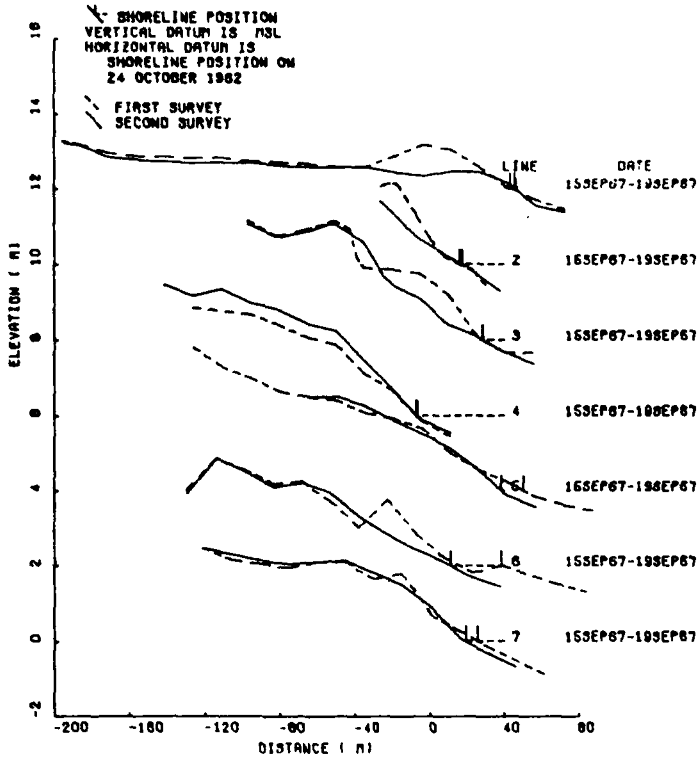
STORM CHANGE PLOTS - PROFILE COMPARISON
FOR SURVEY OF SEVEN PROFILE LINES AT ATLANTIC CITY



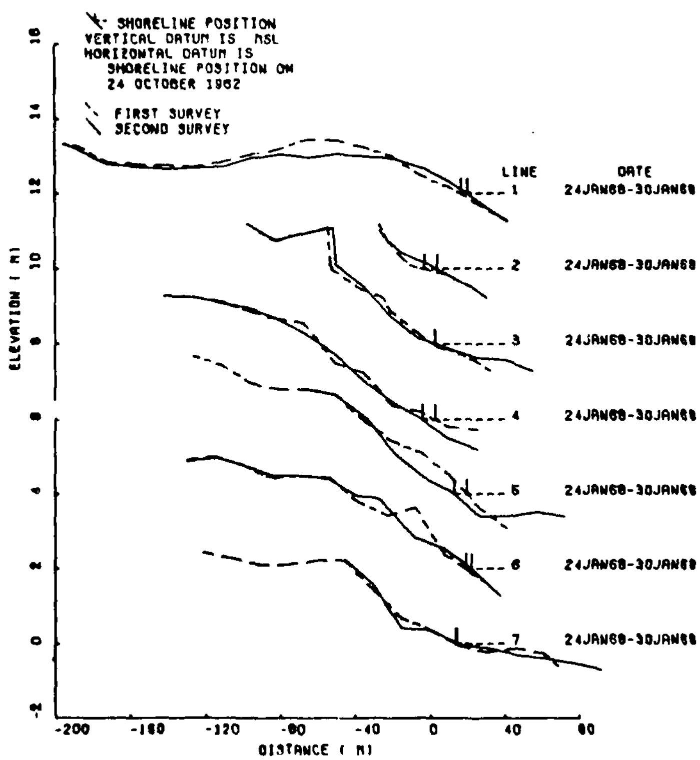
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



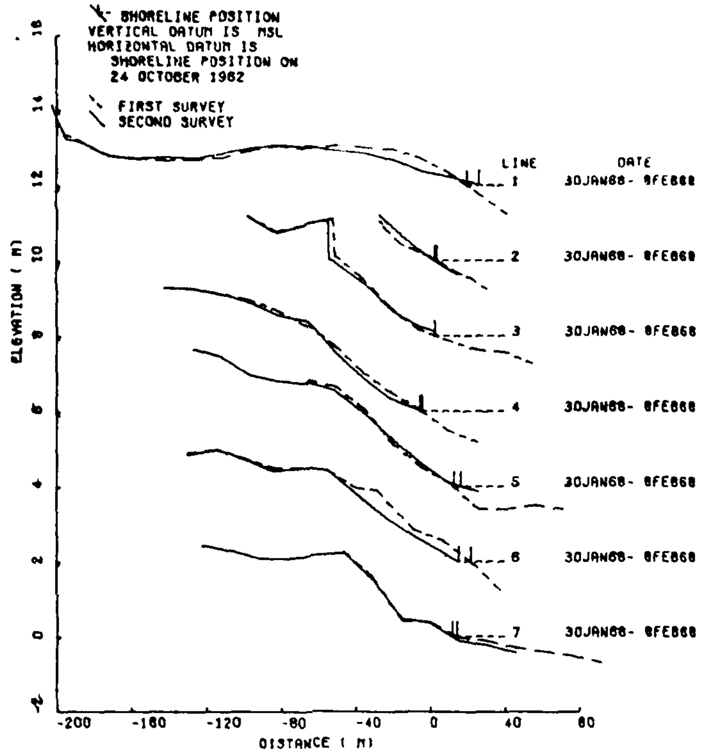
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



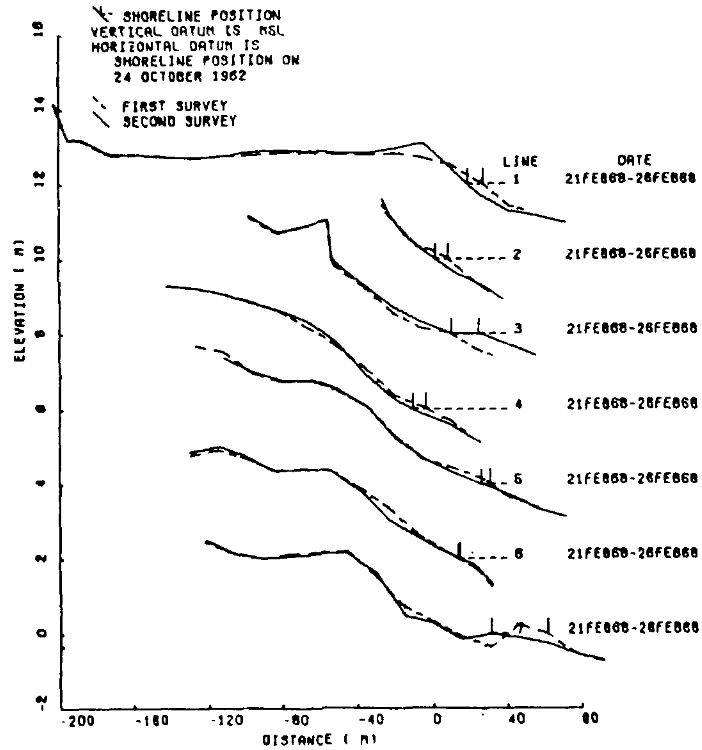
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



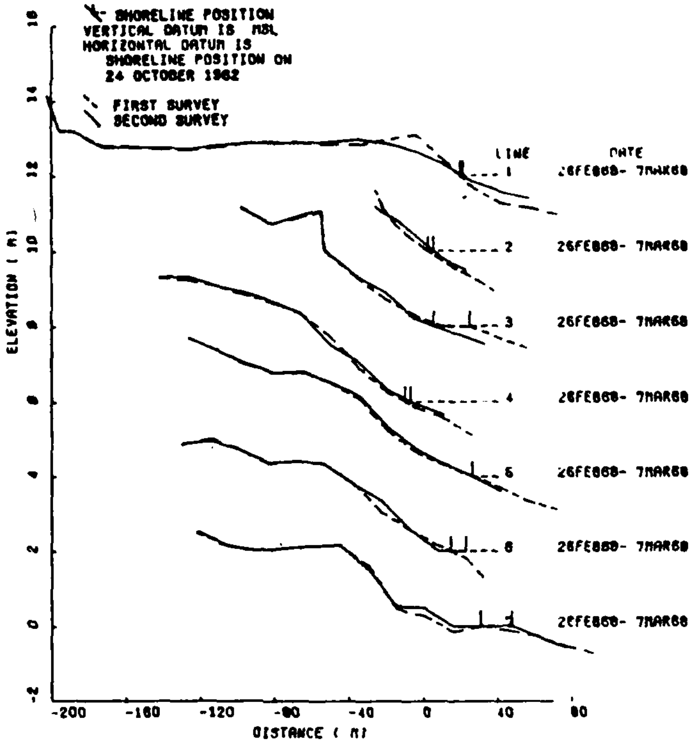
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



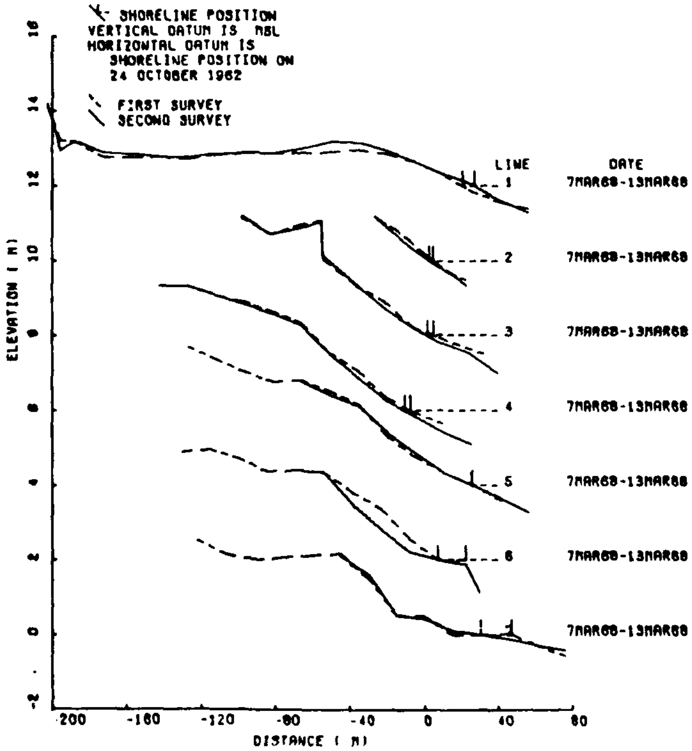
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



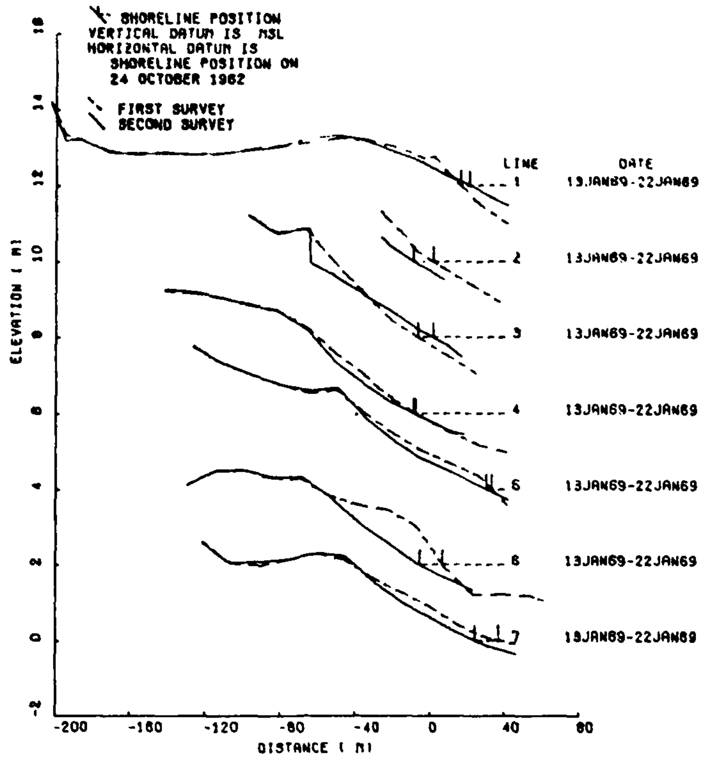
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



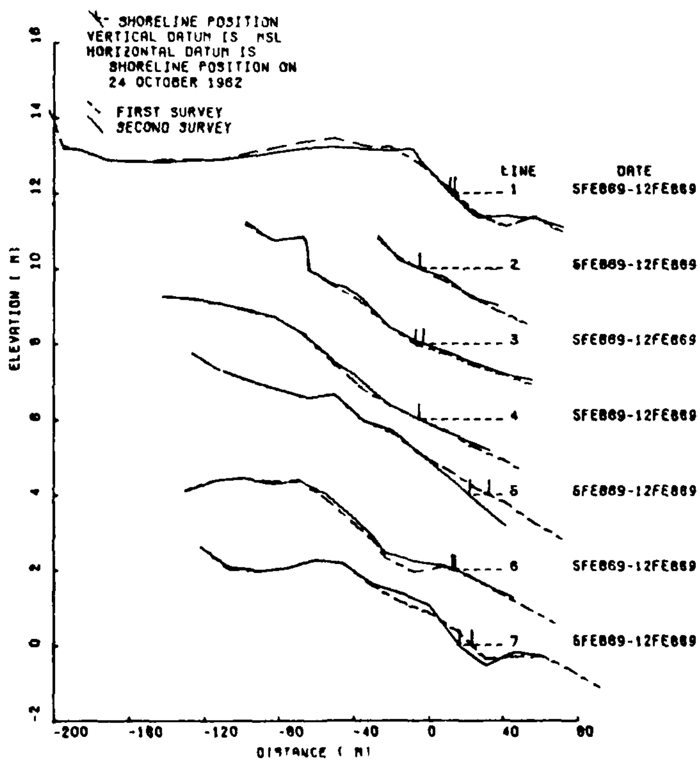
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



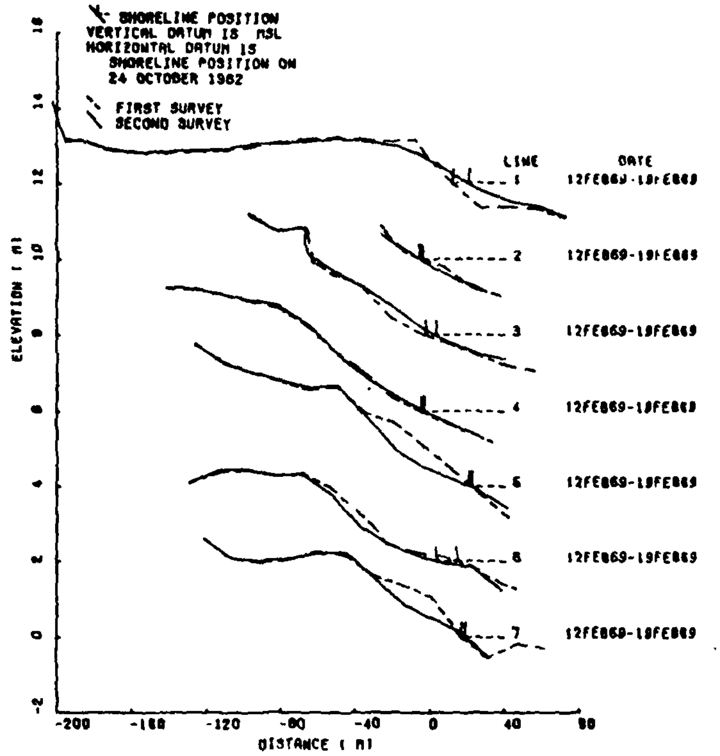
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



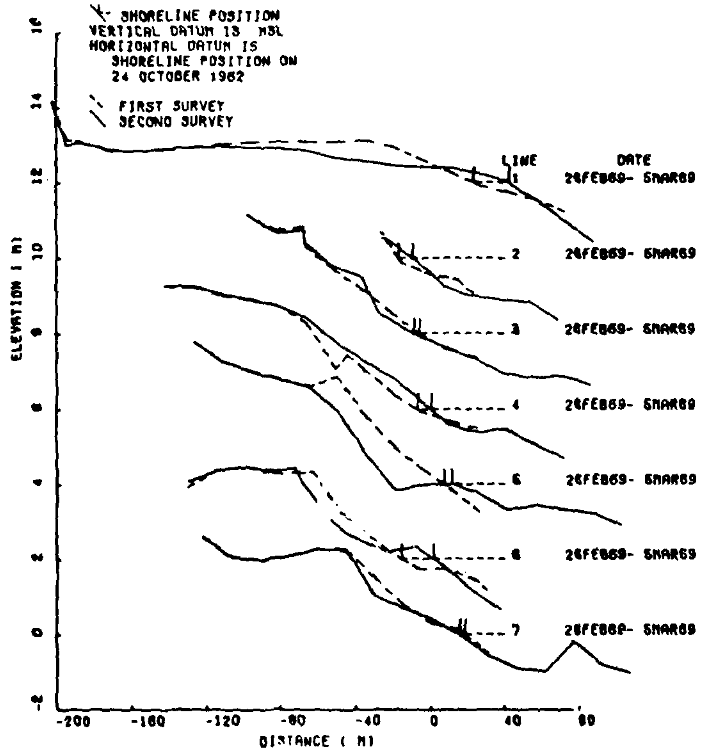
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ



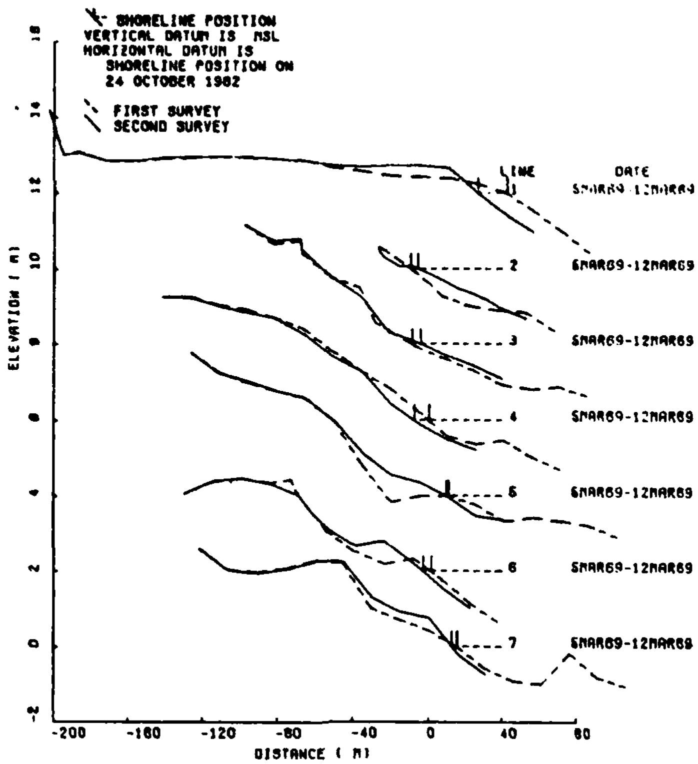
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ



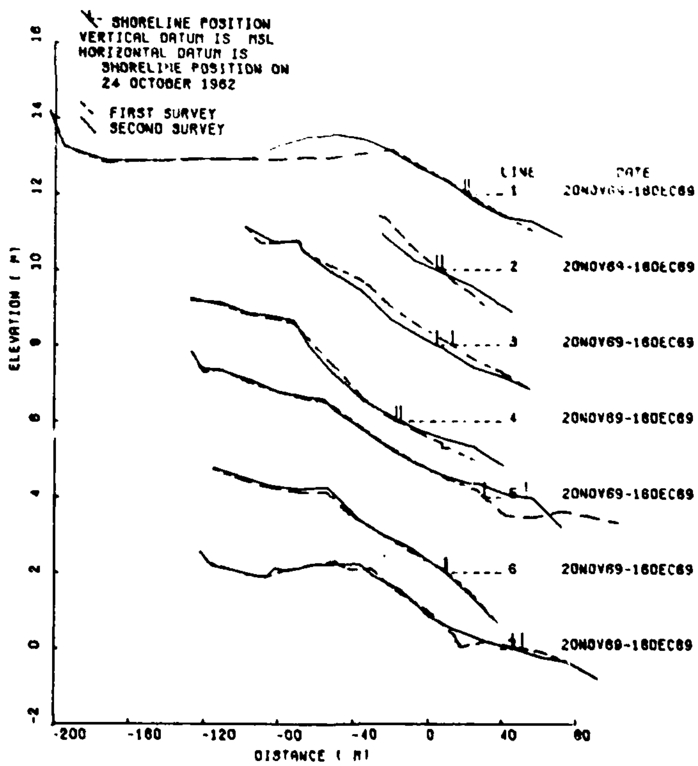
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ



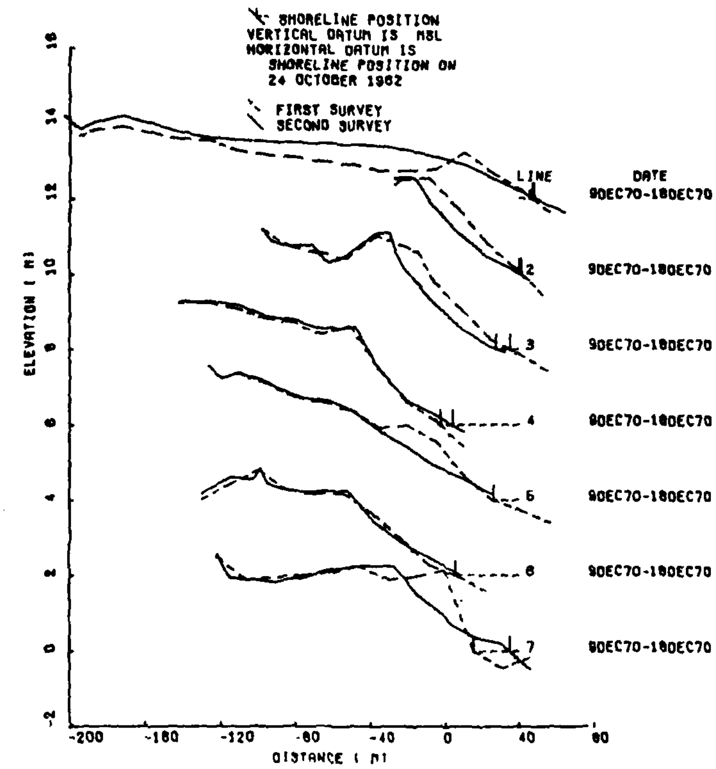
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ



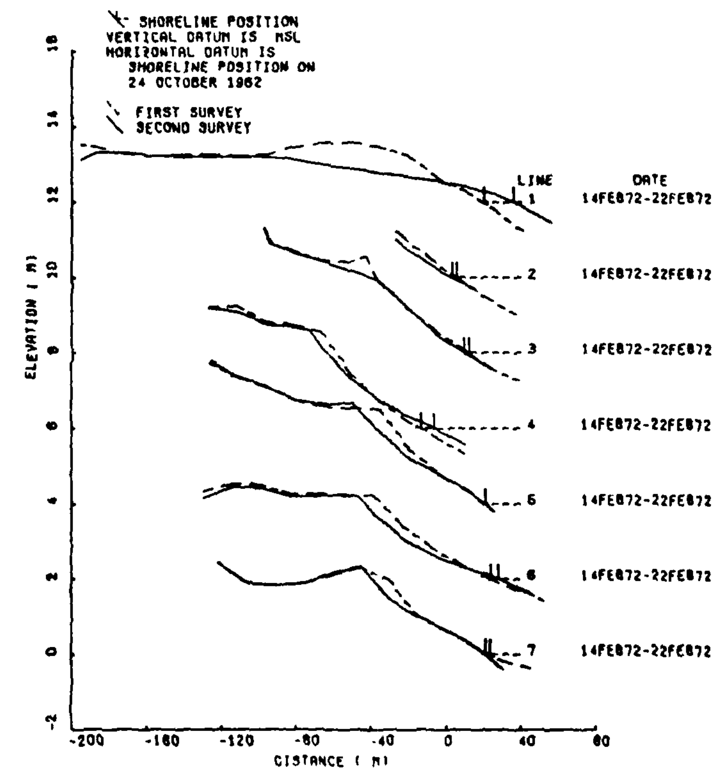
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



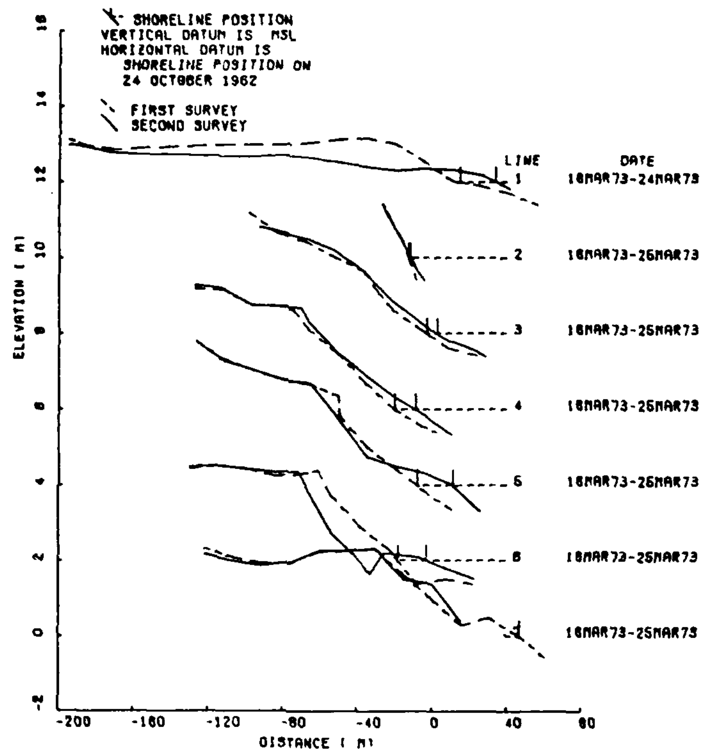
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



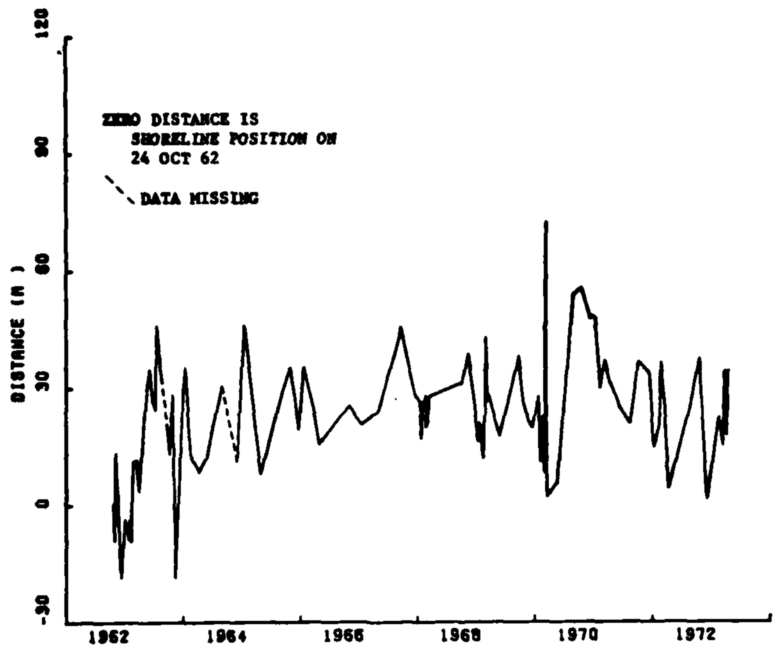
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT ATLANTIC CITY NJ



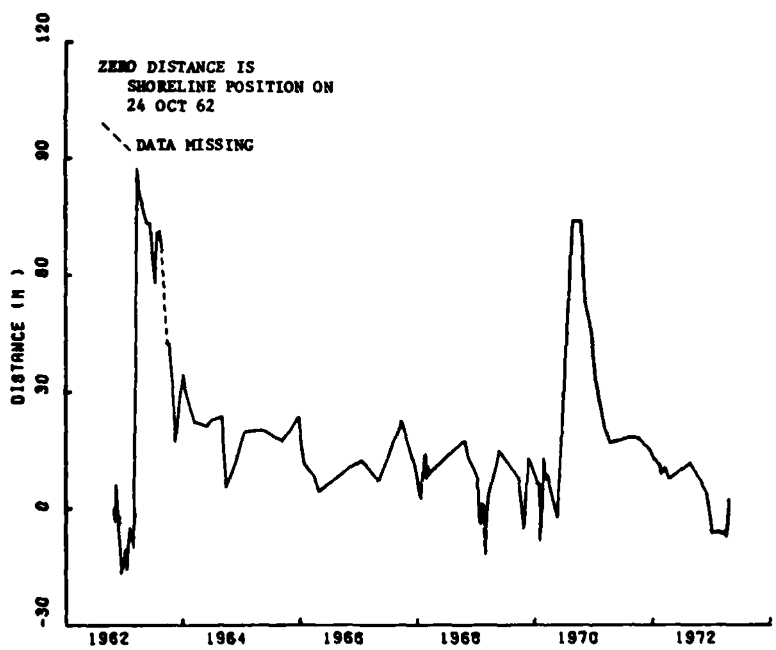
PROFILE COMPARISON FOR SURVEYS OF 7 PROFILE LINES AT
ATLANTIC CITY NJ

APPENDIX D

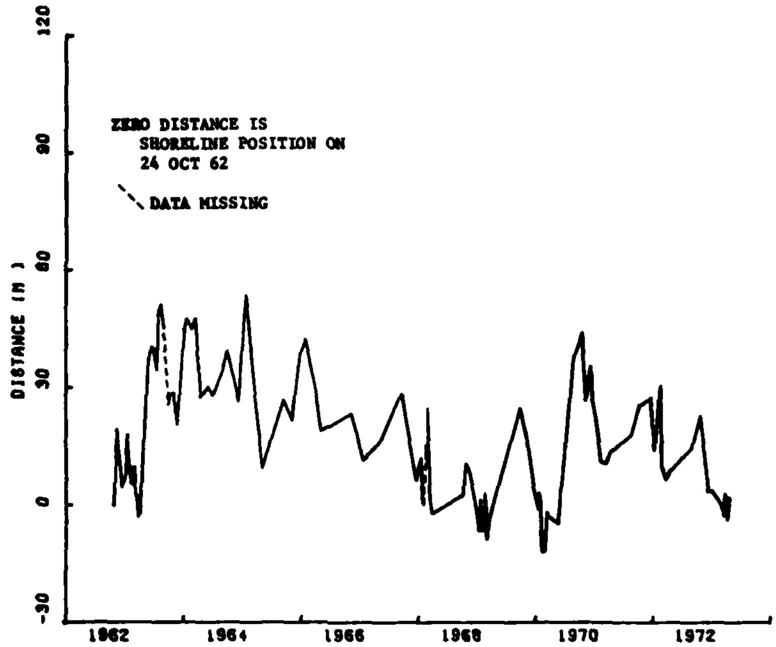
MSL SHORELINE CHANGES



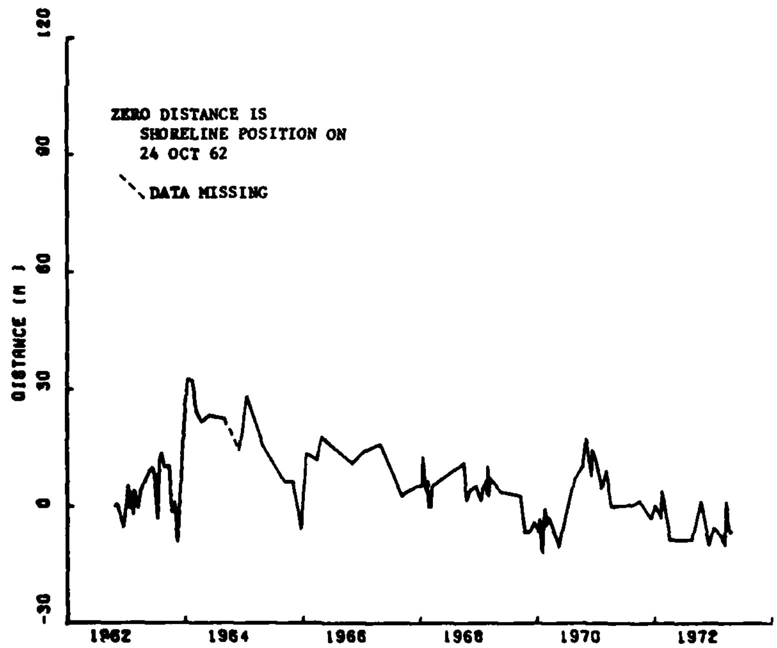
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 1 ATLANTIC CITY, NEW JERSEY



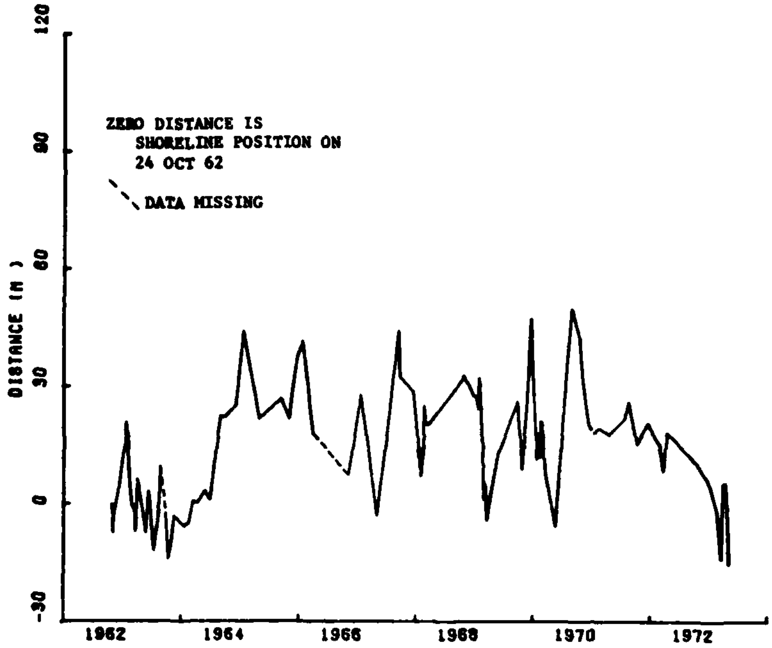
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 2 ATLANTIC CITY, NEW JERSEY



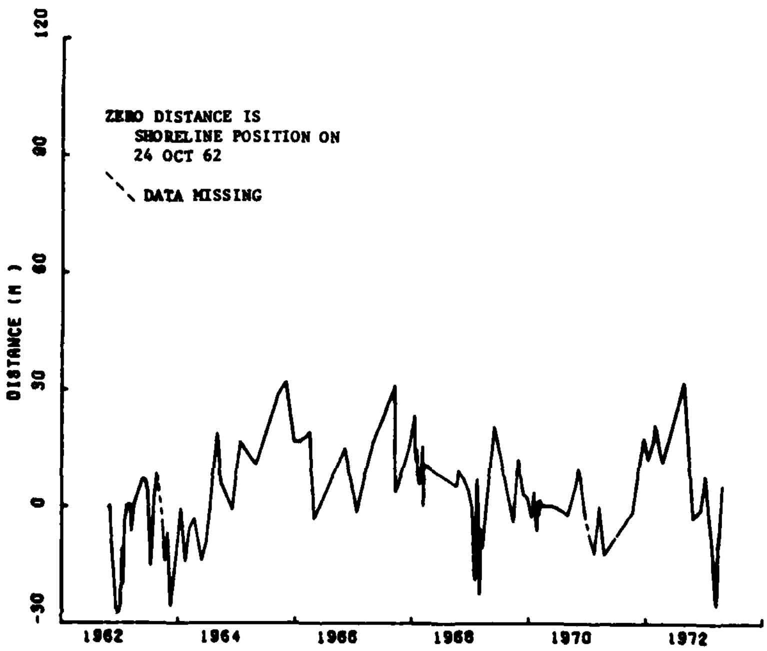
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 3 ATLANTIC CITY, NEW JERSEY



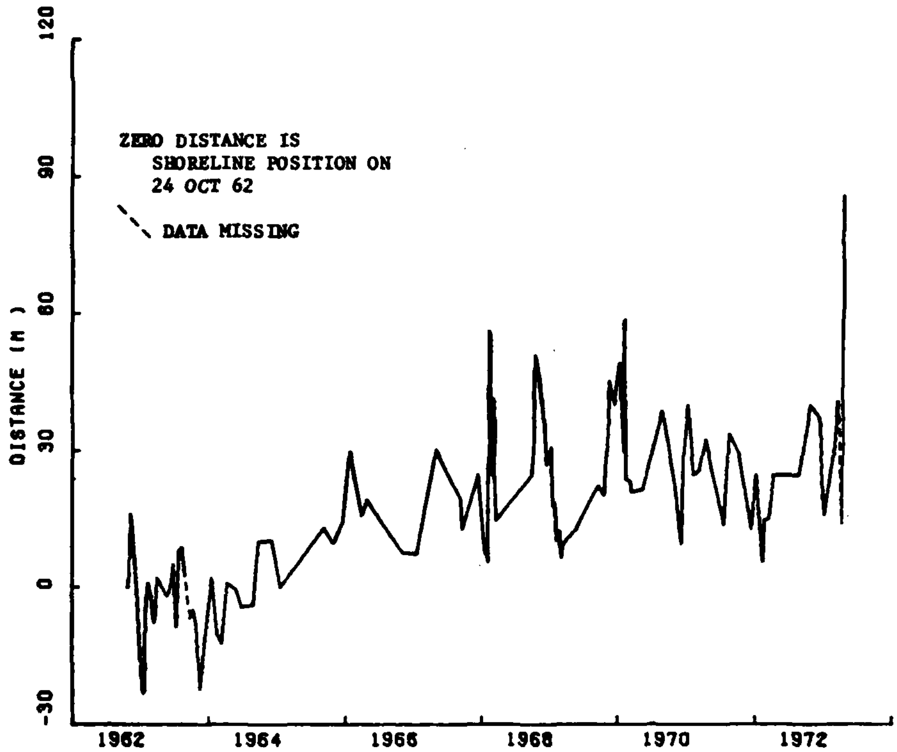
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 4 ATLANTIC CITY, NEW JERSEY



CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 5 ATLANTIC CITY, NEW JERSEY



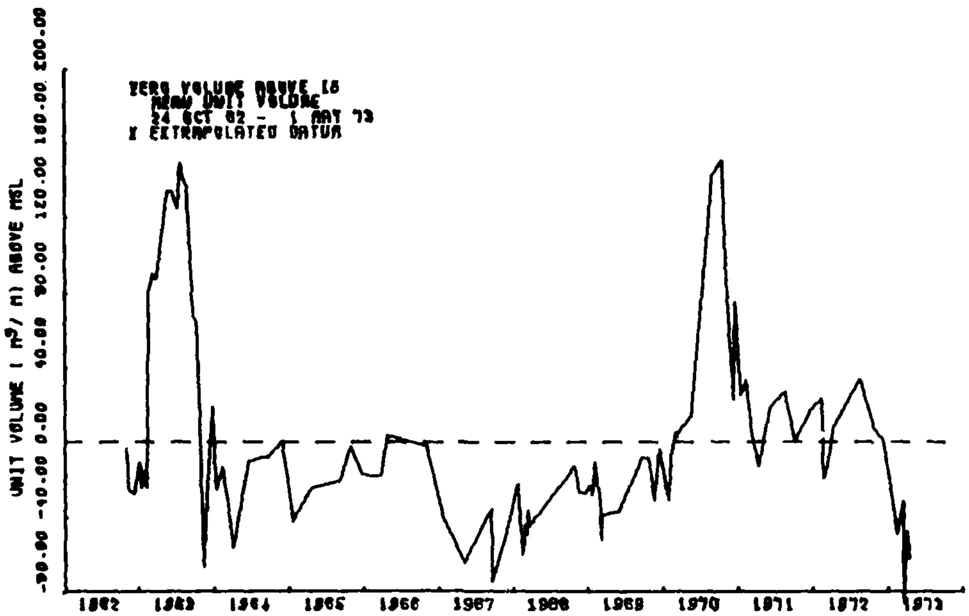
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 6 ATLANTIC CITY, NEW JERSEY



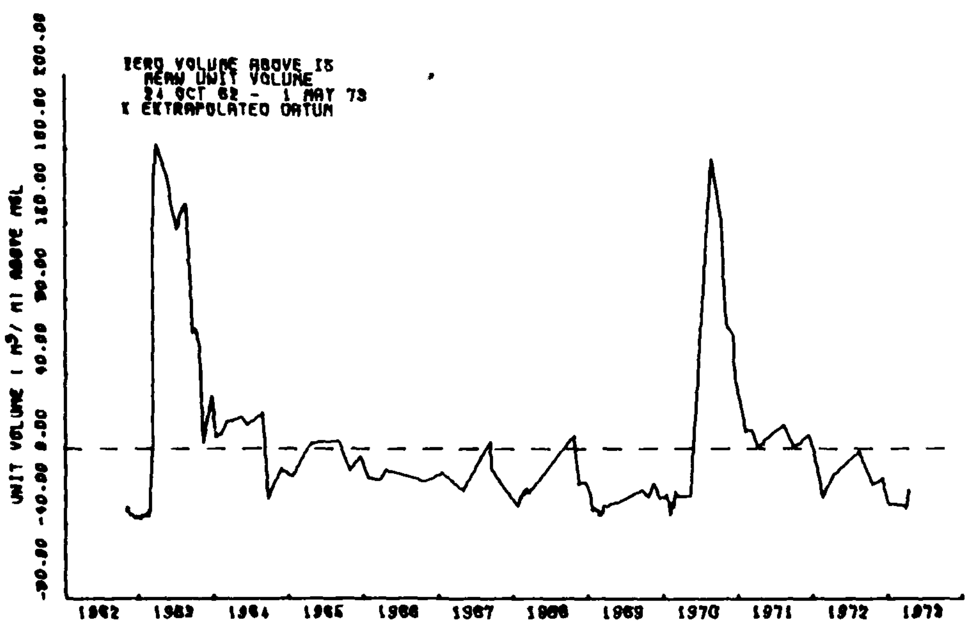
CHANGE IN DISTANCE TO MSL SHORELINE AT
PROFILE LINE 7 ATLANTIC CITY, NEW JERSEY

APPENDIX E

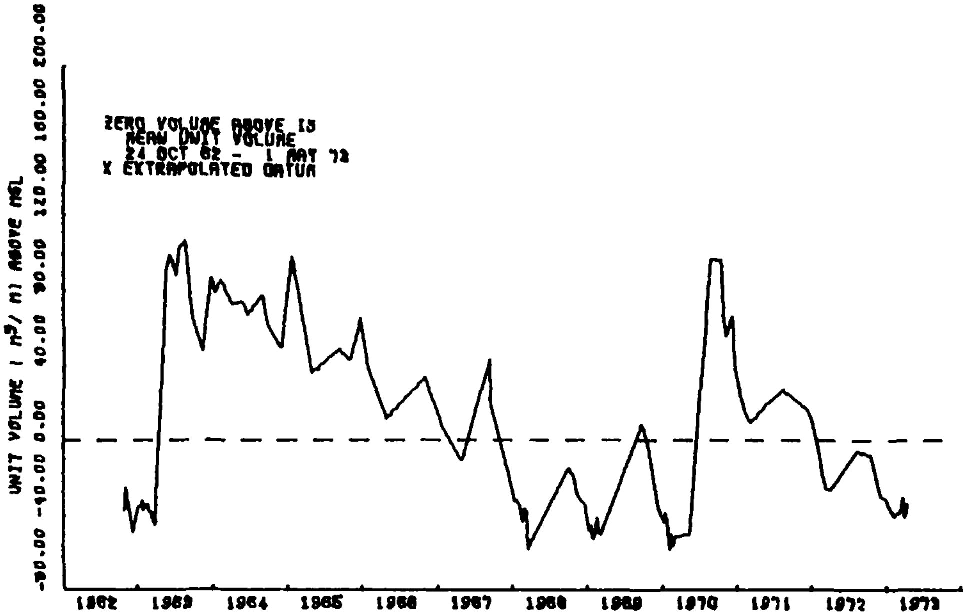
ABOVE MSL UNIT VOLUME CHANGES



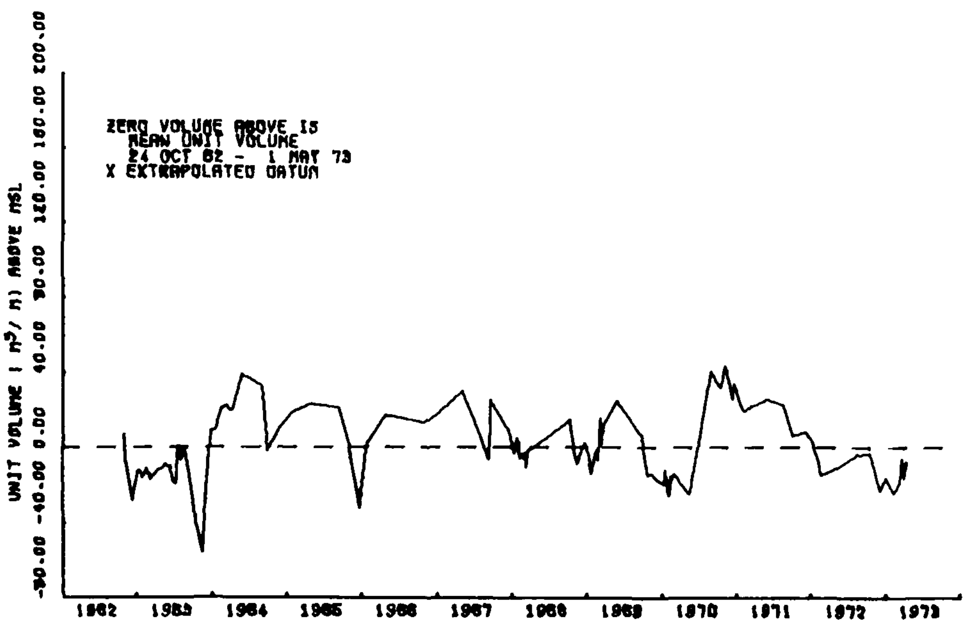
UNIT VOLUME CHANGES FOR PROFILE LINE 1 AT
ATLANTIC CITY NJ



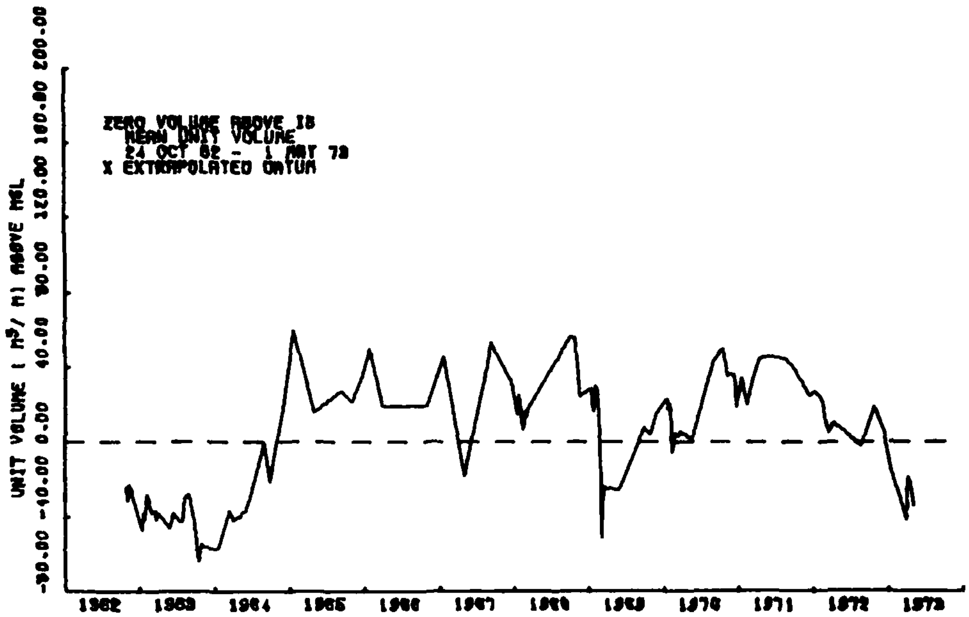
UNIT VOLUME CHANGES FOR PROFILE LINE 2 AT
ATLANTIC CITY NJ



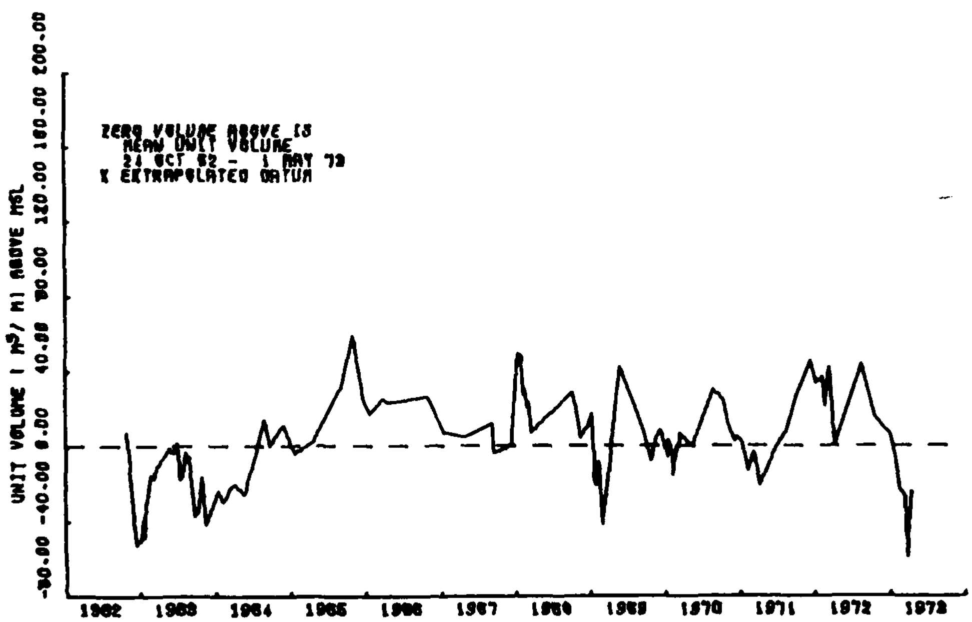
UNIT VOLUME CHANGES FOR PROFILE LINE 3 AT
ATLANTIC CITY NJ



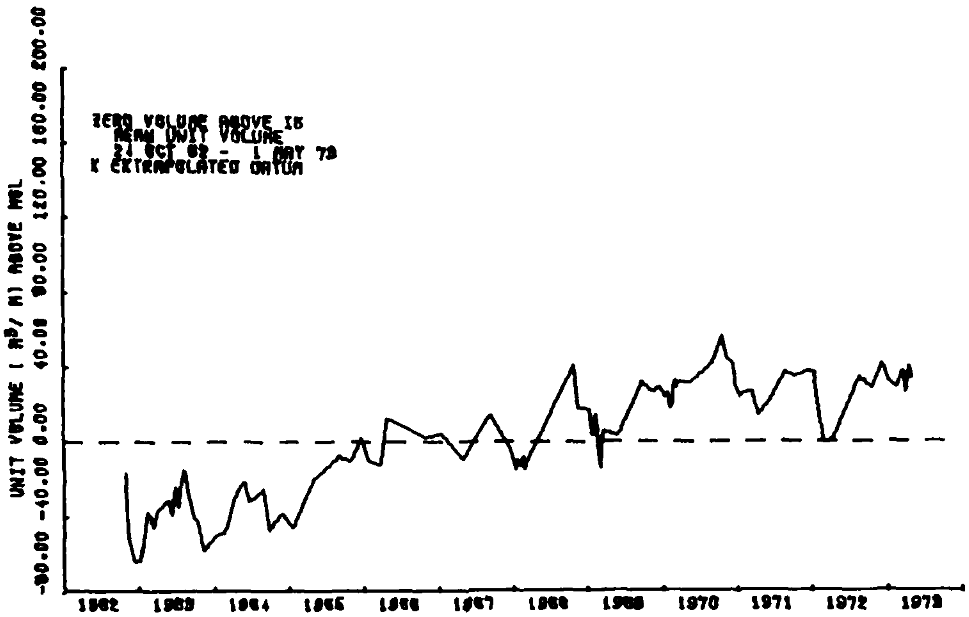
UNIT VOLUME CHANGES FOR PROFILE LINE 4 AT
ATLANTIC CITY NJ



UNIT VOLUME CHANGES FOR PROFILE LINE 5 AT ATLANTIC CITY NJ



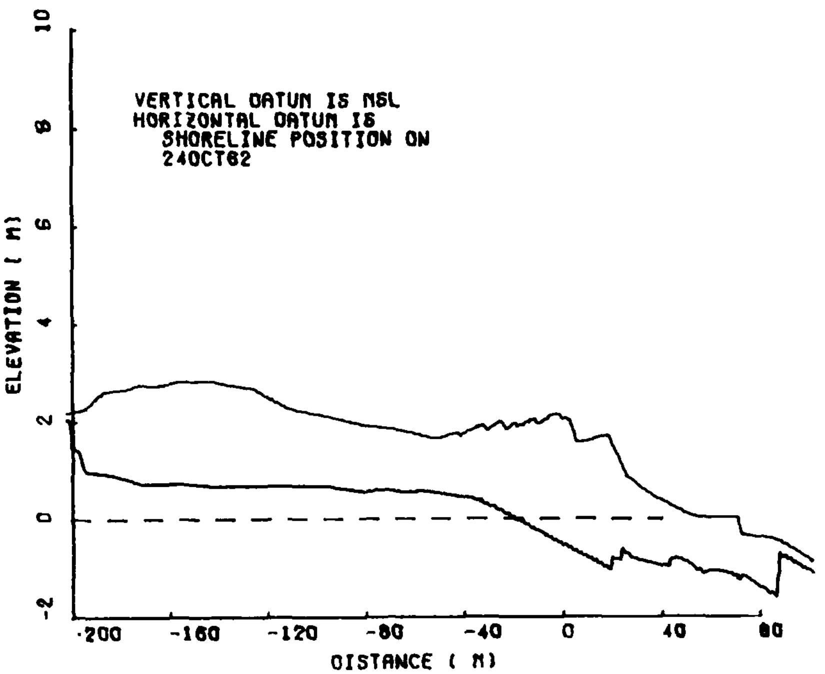
UNIT VOLUME CHANGES FOR PROFILE LINE 6 AT ATLANTIC CITY NJ



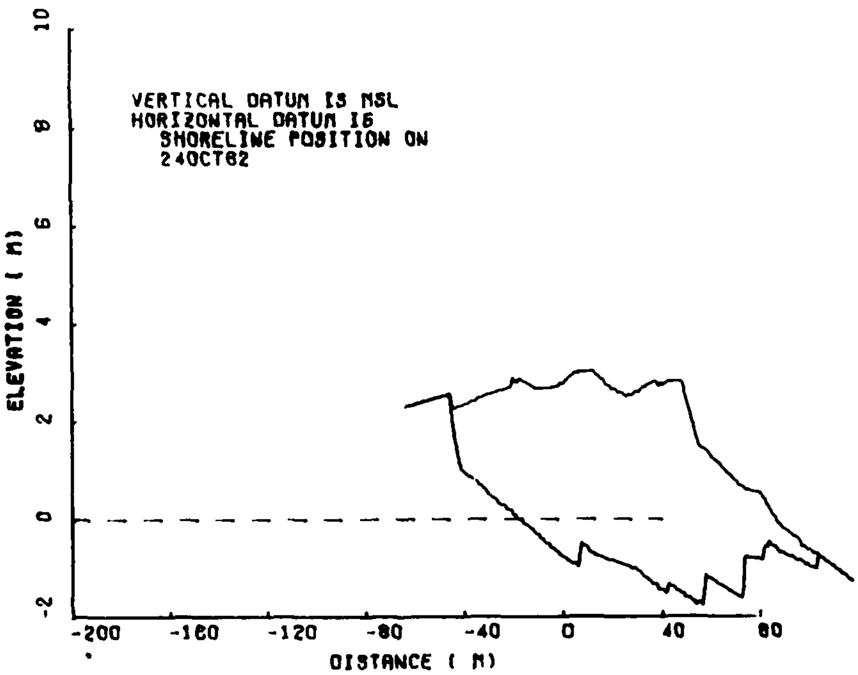
UNIT VOLUME CHANGES FOR PROFILE LINE 7 AT
ATLANTIC CITY NJ

APPENDIX F

PROFILE ENVELOPES



PROFILE ENVELOPE FOR PROFILE LINE 1 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



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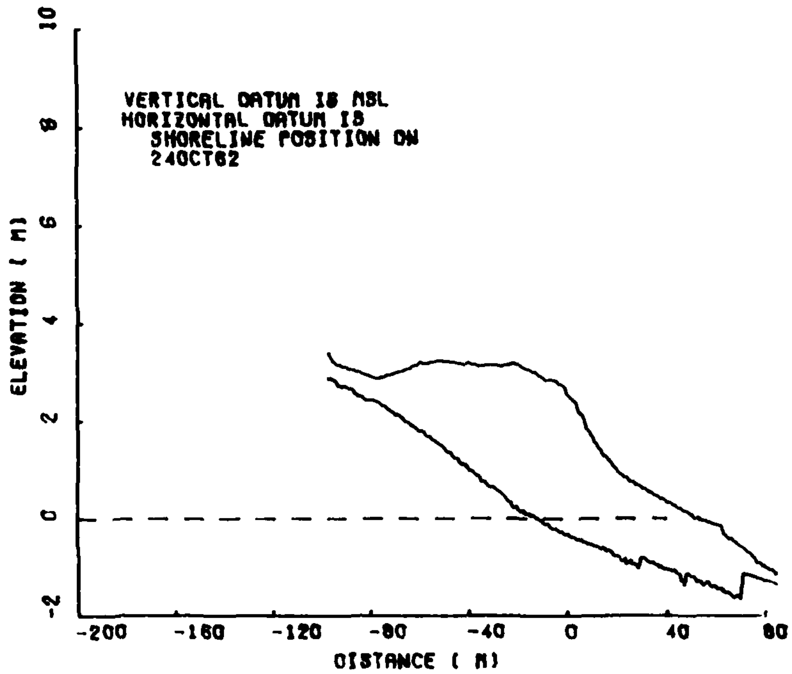
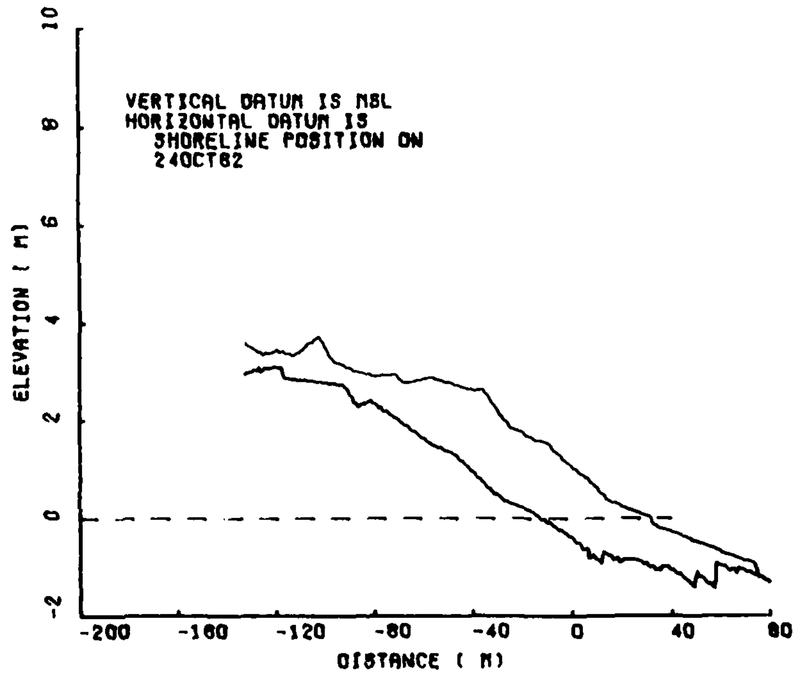
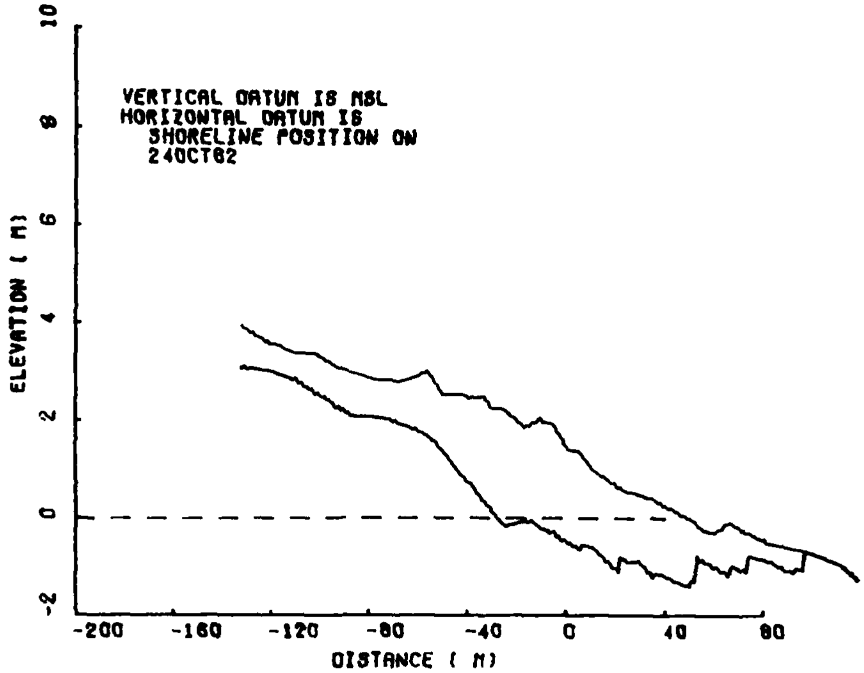
24OCT62 - 18APR73



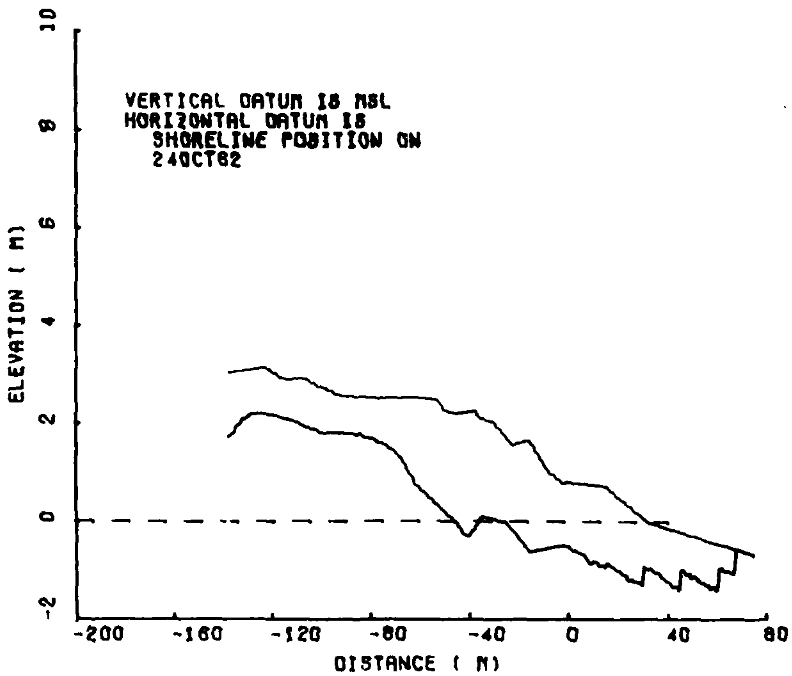
PROFILE ENVELOPE FOR PROFILE LINE 3 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



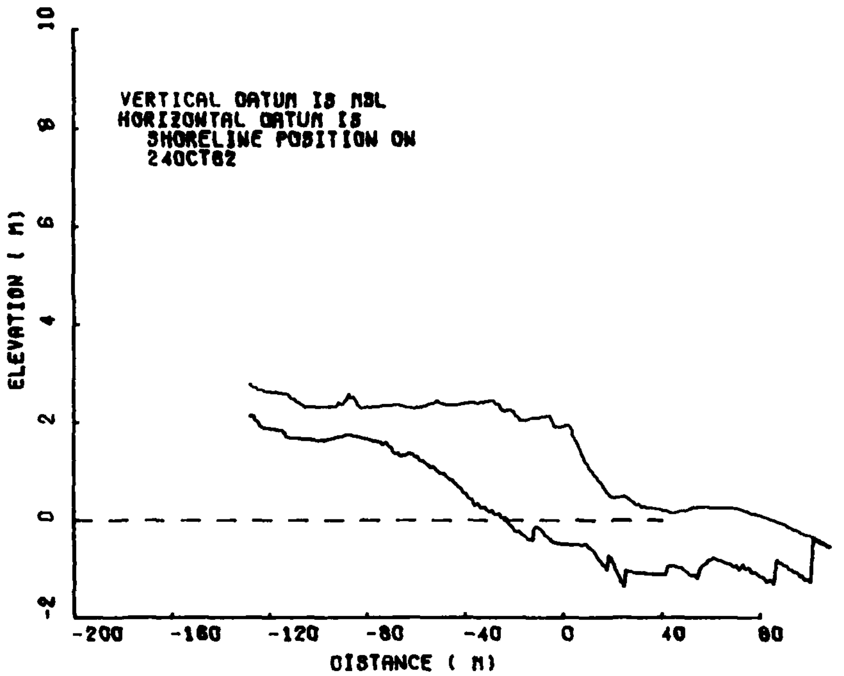
PROFILE ENVELOPE FOR PROFILE LINE 4 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



PROFILE ENVELOPE FOR PROFILE LINE 5 AT ATLANTIC CITY NJ
24OCT62 - 1MAY73



PROFILE ENVELOPE FOR PROFILE LINE 6 AT ATLANTIC CITY NJ
24OCT62 - 18APR73



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McCann, Dennis P.
Beach changes at Atlantic City, New Jersey (1962-73) / by Dennis P. McCann.--Fort Belvoir Va. : U.S. Army Coastal Engineering Research Center ; Springfield, Va. : available from NTIS, 1981.
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TC203 .U581mr no. 81-3 627

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